



SERVICE MANUAL

VHF TRANSCEIVER

IC-F14/S

IC-F15/S

IC-F16/S

IC-F3018

S-14111IZ-C1-②
Mar. 2008

INTRODUCTION

This service manual describes the latest service information for the **IC-F14/S IC-F15/S IC-F16/S IC-F3018** VHF TRANSCEIVER at the time of publication.

MODEL	VERSION	CHANNEL SPACING	CHANNELS
IC-F14	USA-02	15.0/30.0 kHz	16CH
	USA-03		
	USA-04		
	GEN-02	12.5/25.0 kHz	
IC-F15	EUR-02	12.5/20.0/25.0 kHz	
IC-F16	RUS-02	12.5/25.0 kHz	
	RUS-05		
	CHN-02		
IC-F14S	USA-02	15.0/30.0 kHz	2Ch
	USA-03		
	GEN-02		
IC-F15S	EUR-02	12.5/20.0/25.0 kHz	
IC-F16S	RUS-02	12.5/25.0 kHz	
	RUS-05		
IC-F3018	CHN-01		

To upgrade quality, any electrical or mechanical parts and internal circuits are subject to change without notice or obligation.

CAUTION

NEVER connect the transceiver to an AC outlet or to a DC power supply that uses more than specified. This will ruin the transceiver.

DO NOT expose the transceiver to rain, snow or any liquids.

DO NOT reverse the polarities of the power supply when connecting the transceiver.

DO NOT apply an RF signal of more than 20 dBm (100 mW) to the antenna connector. This could damage the transceiver's front-end.

ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:

1. 10-digit Icom parts numbers
2. Component name
3. Equipment model name and unit name
4. Quantity required

<ORDER EXAMPLE>

1110003491	S.IC	TA31136FNG	IC-F14	MAIN UNIT	5 pieces
8820001210	Screw	2438 screw	IC-F14	Top cover	10 pieces

Addresses are provided on the inside back cover for your convenience.



(IC-F14)

REPAIR NOTES

1. Make sure that the problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from its power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a Standard Signal Generator or a Sweep Generator.
7. **ALWAYS** connect a 50 dB to 60 dB attenuator between the transceiver and a Deviation Meter or Spectrum Analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting a test equipment to the transceiver.

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SECTION 1

SPECIFICATIONS

■ GENERAL

- Frequency coverage : 136.000–174.000 MHz
- Mode : FM
- Channel spacing : (Refer to the "INTRODUCTION")
- Number of conventional channels : 16 ch/2 ch (Refer to the "INTRODUCTION")
- Antenna impedance : 50 Ω
- Operating temperature range : –30°C to +60°C (–22°F to +140°F) [F14/S, F16/S, F3018]
–25°C to +55°C [F15/S]
- Power supply requirement : Specified Icom's battery pack only (7.2 V DC nominal; negative ground)
- Current drain (at 7.2 V DC ; approx.) :

RECEIVING		TRANSMITTING	
Stand-by	Max. audio	High (at 5 W)	Low (at 1 W)
70 mA	300 mA	1.5 A	0.7 A

- Dimensions (projections not included) : 53(W)×120(H)×38(D) mm; 2 ³/₃₂(W)×4 ²³/₃₂(H)×1 ¹/₂(D) in
- Weight (Including BP-231) : Approx. 260 g (9³/₁₆ oz)

■ TRANSMITTER

- Output power (at 7.2 V DC) : 5 W
- Modulation : Variable reactance frequency modulation
- Maximum permissible deviation : \pm 5.0 kHz (Wide), \pm 4.0 kHz (Middle), \pm 2.5 kHz (Narrow)
- Frequency error : \pm 2.5 ppm
- Spurious emissions : 80 dB (typical) [F14/S, F16/S, F3018]
0.25 μ W (\leq 1 GHz), 1.0 μ W (> 1 GHz) [F15/S]
- Adjacent channel power : 70 dB min. (80dB typ.) for Wide and Middle
60 dB min. (70dB typ.) for Narrow
- Audio harmonic distortion : 3% typical (1 kHz, 40% deviation)
- Hum and Noise ([F14/S, F16/S, F3018]) : 40 dB min. (46 dB typ.) for Wide
34 dB min. (40 dB typ.) for Narrow
- Residual modulation ([F15/S]) : 45 dB min. (55 dB typ.) for Wide
43 dB min. (53 dB typ.) for Middle
40 dB min. (50 dB typ.) for Narrow
- Limiting charact of modulator : 60–100% of maximum deviation
- Microphone impedance : 2.2 k Ω

■ RECEIVER

- Receive system : Double conversion superheterodyne system
- Intermediate frequencies : 1st IF: 46.35 MHz, 2nd IF: 450 kHz
- Sensitivity : 0.25 μ V (–119 dBm) typical at 12 dB SINAD [F14/S, F16/S, F3018]
–4 dB μ (–111 dBm) emf typical at 20 dB SINAD [F15/S]
- Adjacent channel selectivity : 70 dB min. (75 dB typ.) for Wide and Middle
60 dB min. (65 dB typ.) for Narrow
- Spurious response : 70 dB min.
- Intermodulation rejection ratio : 70 dB min. (74 dB typ.) [F14/S, F16/S, F3018]
65 dB min. (67 dB typ.) [F15/S]
- Hum and Noise ([F14/S, F16/S, F3018]) : 40 dB min. (50 dB typ.) for Wide
34 dB min. (45 dB typ.) for Narrow
- Hum and Noise ([F15/S]) : 45 dB min. (55 dB typ.) for Wide
43 dB min. (53 dB typ.) for Middle
40 dB min. (50 dB typ.) for Narrow
- Audio output power : 0.5 W typical at 5% distortion with an 8 Ω load
- Squelch sensitivity (at threshold) : 0.25 μ V typical [F14/S, F16/S, F3018]
–4 dB μ V emf typical [F15/S]
- Output impedance (Audio) : 8 Ω

Specifications are measured in accordance with EIA-152-C/204D, TIA-603 or EN 300 086.

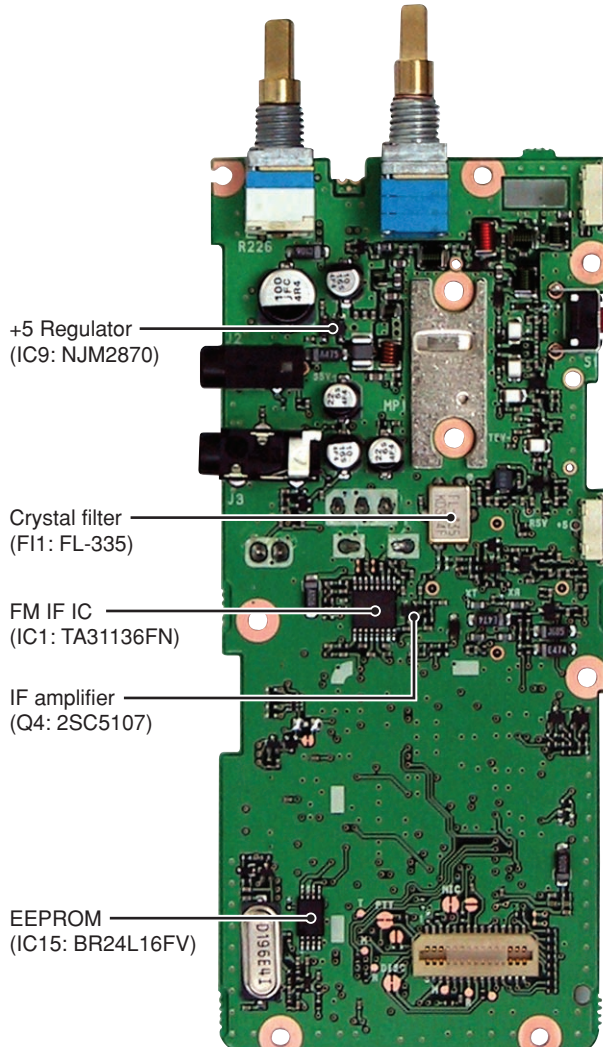
All stated specifications are subject to change without notice or obligation.

SECTION 2

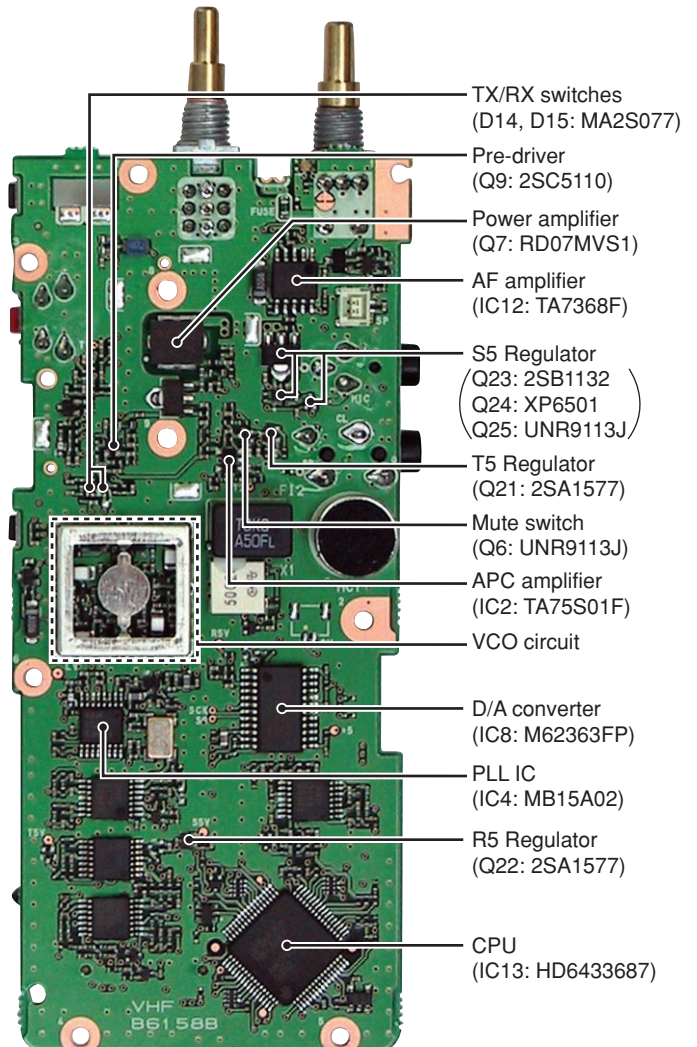
INSIDE VIEWS

• MAIN UNIT

TOP VIEW



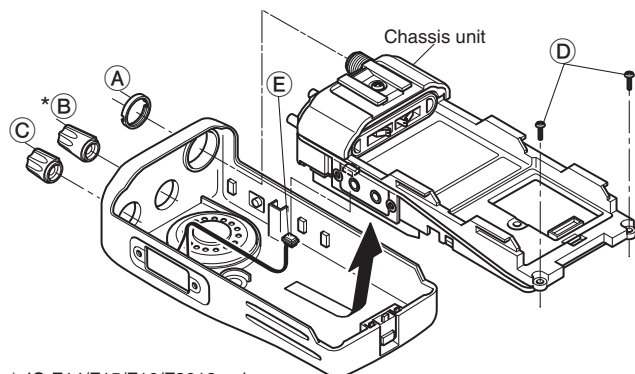
BOTTOM VIEW



SECTION 3 DISASSEMBLY INSTRUCTION

1. REMOVING THE CHASSIS UNIT

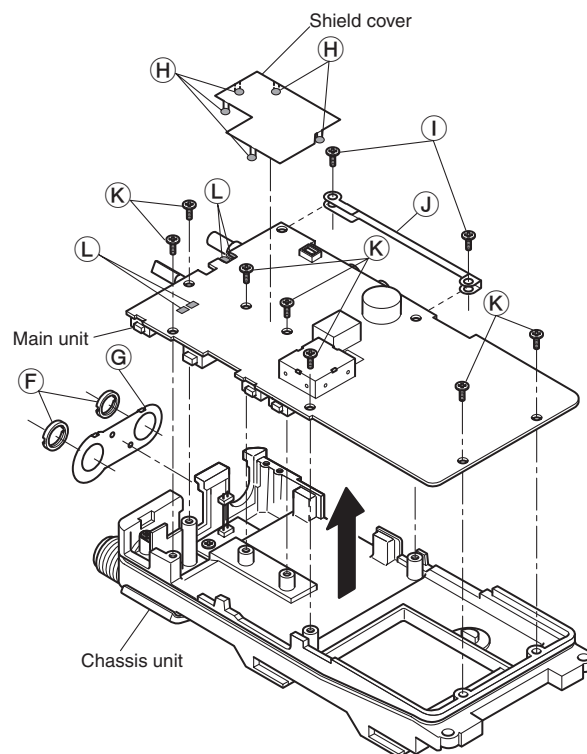
- ① Unscrew 1 nut (A), and remove 2 knobs (B), (C).
- ② Unscrew 2 screws (D).
- ③ Take off the chassis unit in the direction of the arrow.
- ④ Unplug the connector (E) from the chassis unit.



*: IC-F14/F15/F16/F3018 only

2. REMOVING THE MAIN UNIT

- ① Unscrew 2 nuts (F), and remove the top plate (G).
- ② Unsolder 5 points (H), and remove the shield cover.
- ③ Unscrew 2 screws (I), and remove the side plate (J).
- ④ Unscrew 7 screws (K).
- ⑤ Unsolder 4 points (L), and take off the main unit in the direction of the arrow.



4-1 RECEIVER CIRCUITS

4-1-1 ANTENNA SWITCHING CIRCUIT

The antenna switching circuit functions as a low-pass filter while receiving and a resonator circuit while transmitting. This circuit does not allow transmit signals to enter the receiver circuits.

Received signals enter the antenna connector (CHASSIS; J1) and pass through the low-pass filter (L1–L3, C2–C5, C175, C176). The filtered signals are passed through the $1/4\lambda$ type antenna switching circuit (D5, D6, L6, L7) and then applied to the RF circuit.

4-1-2 RF CIRCUIT

The RF circuit amplifies signals within the range of frequency coverage and filters out-of-band signals.

The signals from the antenna switching circuit pass through the bandpass filter (D4, D8, L8, L9). The filtered signals are amplified at the RF amplifier (Q2) and then passed through the another bandpass filter (D9, D10, L11) to suppress unwanted signals. The filtered signals are applied to the 1st mixer circuit.

D4, D8–D10 employ varactor diodes, that are controlled by the CPU via the D/A converter (IC8), to track the bandpass filter. These varactor diodes tune the center frequency of an RF passband for wide bandwidth receiving and good image response rejection.

4-1-3 1ST MIXER AND 1ST IF CIRCUITS

The 1st mixer circuit converts the received signal into fixed frequency of the 1st IF signal with the PLL output frequency. By changing the PLL frequency, only the desired frequency passes through a crystal filter at the next stage of the 1st mixer.

The RF signals from the bandpass filter are mixed with the 1st LO signals, where come from the RX VCO circuit via the attenuator (R26–R28), at the 1st mixer circuit (Q3) to produce a 46.35 MHz 1st IF signal. The 1st IF signal is passed through a monolithic filter (F11) in order to obtain selection capability and to pass only the desired signal. The filtered signal is applied to the 2nd IF circuit after being amplified at the 1st IF amplifier (Q4).

4-1-4 2ND IF AND DEMODULATOR CIRCUITS

The 2nd mixer circuit converts the 1st IF signal into a 2nd IF signal. The double-conversion superheterodyne system (which convert receive signals twice) improves the image rejection ratio and obtains stable receiver gain.

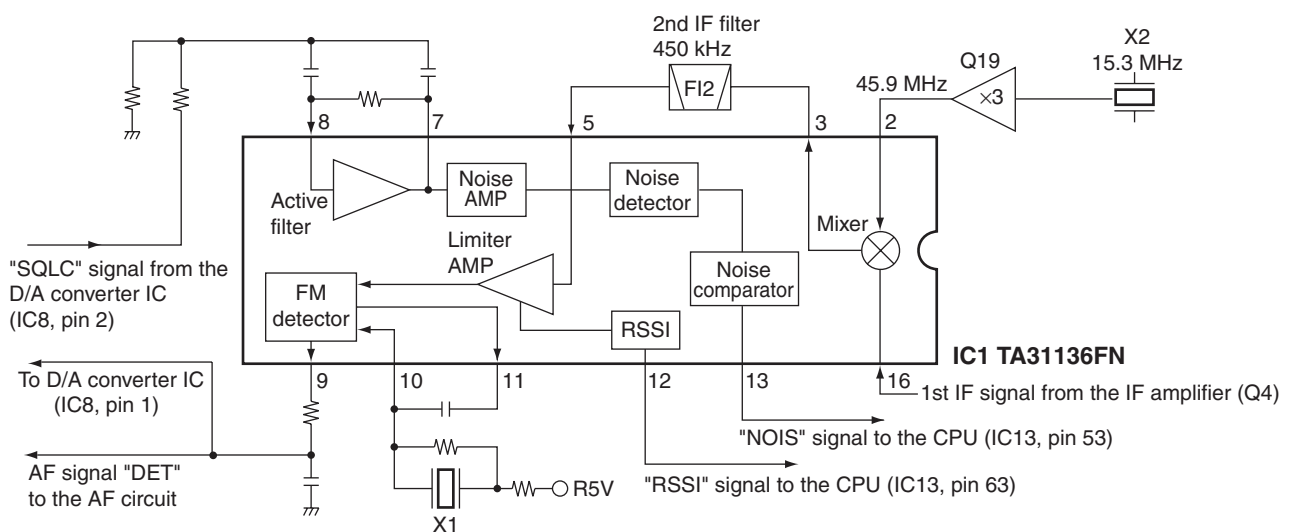
The 1st IF signal from the IF amplifier (Q4) is applied to the 2nd mixer section of the FM IF IC (IC1, pin 16), and is mixed with the 2nd LO signal to be converted into a 450 kHz 2nd IF signal.

The FM IF IC (IC1) contains the 2nd mixer, 2nd local oscillator, limiter amplifier, quadrature detector, active filter and noise amplifier circuits. A 2nd LO signal (45.9 MHz) is produced at the PLL circuit by tripling it's reference frequency (15.3 MHz).

The 2nd IF signal from the 2nd mixer (IC1, pin 3) passes through the ceramic filter (F12) to remove unwanted heterodyned frequencies. It is then amplified at the limiter amplifier section (IC1, pin 5) and applied to the quadrature detector section (IC1, pins 10, 11) to demodulate the 2nd IF signal into AF signals.

The demodulated AF signals are output from pin 9 (IC1) as "DET" signal, and are then applied to the AF circuit.

• 2ND IF AND DEMODULATOR CIRCUITS



4-1-5 AF AMPLIFIER CIRCUIT

The AF amplifier circuit amplifies the demodulated AF signals to drive a speaker.

The AF signals from the FM IF IC (IC1, pin 9) pass through the high-pass filter (IC6, pins 3 and 1) to suppress unwanted harmonic components. The signals pass through the RX mute switch (Q34) which is controlled by "RMUT" signal from the CPU (IC13, pin 56), and are then applied to another high-pass filter (IC6, pins 13 and 14). The filtered signals pass through the low-pass filter (IC6, pins 6 and 7) via the analog switch (IC10, pins 1 and 2). The signals are applied to the analog switch (IC10, pin 10) again, and are then applied to the AF power amplifier (IC12, pin 4) via the AF volume (R226). The amplified AF signals are output from pin 10, and are then applied to the internal speaker which is connected with J1 via the [SP] jack.

4-1-6 RECEIVE MUTE CIRCUITS

• NOISE SQUELCH

A squelch circuit cuts out AF signals when no RF signals are received. By detecting noise components in the AF signals, the squelch circuit switches the AF mute switch.

Some noise components in the AF signals from the FM IF IC (IC1, pin 9) are applied to the D/A converter (IC8, pin 1) as "DET" signal, and are then output from pin 2. The signals are applied to the active filter section in the FM IF IC (IC1, pin 8). The active filter section filters and amplifies noise components. The amplified signals are converted into the pulse-type signals at the noise detector section and output from pin 13 as "NOIS" signal.

The "NOIS" signal from the FM IF IC is applied to the CPU (IC13, pin 53). Then the CPU analyzes the noise condition and outputs the AF mute control signal from the CPU (pin 56) as "RMUT" signal. The signal is applied to the RX mute switch (Q34) to control the AF signal muting.

• CTCSS AND DTCS

The tone squelch circuit detects tone signals and opens the squelch only when receiving a signal containing a matched subaudible tone (CTCSS or DTCS). When tone squelch is in use, and a signal with a mismatched or no subaudible tone is received, the tone squelch circuit mutes the AF signals even when noise squelch is open.

A portion of the "DET" signals from the FM IF IC (IC1, pin 9) passes through the low-pass filter (IC7, pins 10 and 8) to remove AF (voice) signals, and are then applied to the amplifier (IC7, pin 12). The amplified signals are applied to the CTCSS or DTCS decoder inside of the CPU (IC13, pin 60) as the "CDEC" signal. The CPU outputs AF mute control signal, and is then applied to the RX mute switch (Q34) and analog switch (IC10, pins 12 and 13) to control AF signals muting as "RMUT" signal.

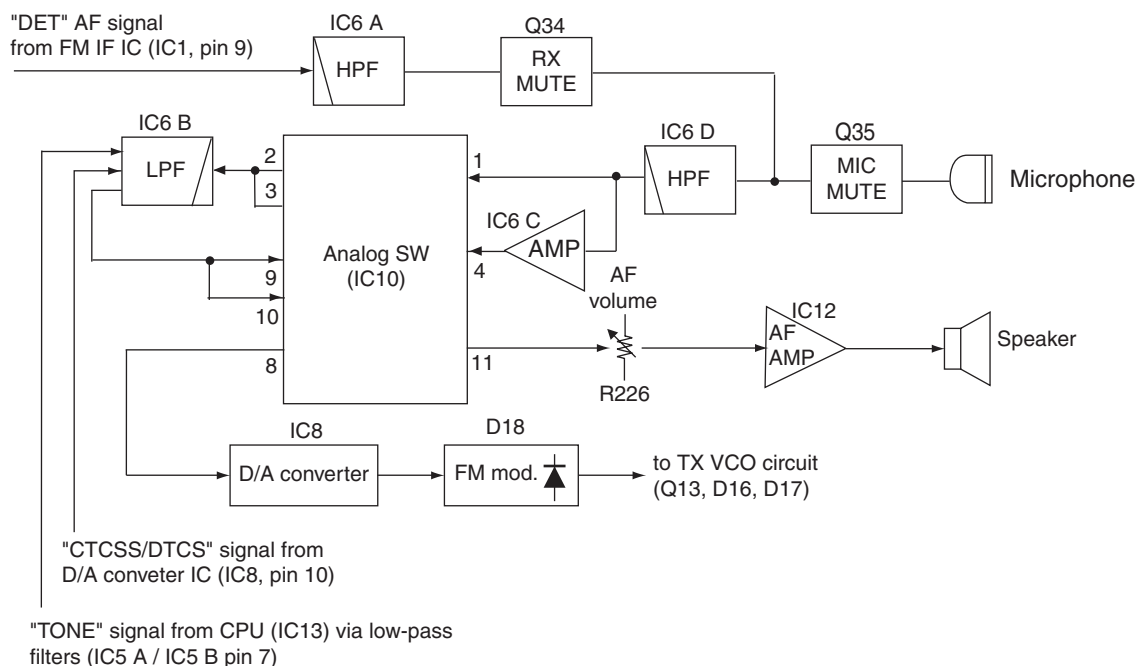
4-2 TRANSMITTER CIRCUITS

4-2-1 MICROPHONE AMPLIFIER CIRCUIT

The microphone amplifier circuit amplifies audio signals within +6 dB/octave pre-emphasis characteristics from the microphone to a level needed for the modulation circuit.

The AF signals from the microphone are passed through the microphone mute switch (Q35), and are then applied to the amplifier (IC6, pins 9 and 8) via the high-pass filter (IC6, pins 13 and 14). The amplified signals are applied to the analog switch (IC10, pin 4), and outputs from pin 3. The signals pass through the low-pass filter (IC6, pins 6 and 7), then applied to the analog switch (IC10, pin 9) again. The signals are applied to the D/A converter (IC8, pin 4). The converted signals output from pin 3, and applied to the modulation circuit (D18) as "MOD" signal.

• ANALOG SWITCHING CIRCUITS



4-2-2 MODULATION CIRCUIT

The modulation circuit modulates the VCO oscillating signal (RF signal) using the microphone audio signals.

The AF signals from the D/A converter (IC8, pin 3) change the reactance of varactor diode (D18) to modulate the oscillated signal at the TX VCO circuit (Q13, D16, D17). The modulated VCO signal is amplified at the buffer amplifiers (Q12, Q10) and is then applied to the drive amplifier circuit via the T/R switch (D14).

The CTCSS/DTCS signals ("CENC0", "CENC1", "CENC2") from the CPU (IC13, pins 23–25) pass through the low-pass filter (IC5, pins 12 and 14) via 3 registers (R191–R193) to change its wave form. Then the signals are applied to the D/A converter (IC8, pin 9). The output signals from the D/A converter (IC8, pin 10) pass through the low-pass filter (IC6, pins 6 and 7) to be mixed with "MOD" signal at the filter (IC6), and are then applied to the D/A converter again (IC8, pin 4).

4-2-3 DRIVE/POWER AMPLIFIER CIRCUITS

The drive/power amplifier circuits amplify the VCO oscillating signal to an output power level.

The modulated RF signal from the TX VCO circuit passes through the T/R switch (D14), and is amplified at the pre-drive (Q9), drive (Q8) and power (Q7) amplifiers to obtain 5 W of RF power (at 7.2 V DC).

The amplified signal passes through the power detector (D1), antenna switch (D2) and low-pass filter (L1–L3, C2–C5, C175, C176), and is then applied to the antenna connector (CHASSIS unit; J1).

The bias current of the pre-drive (Q9), drive (Q8) and power (Q7) amplifiers are controlled by the APC circuit.

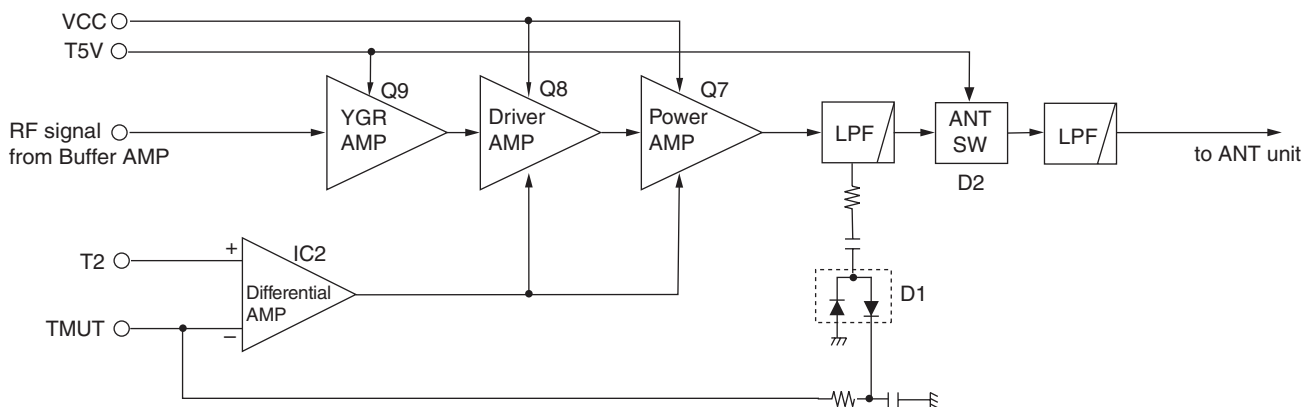
4-2-4 APC CIRCUITS

The APC circuit (IC2, D1) protects drive and power amplifiers from the reflected signal, and selects output power of HIGH, LOW2 or LOW1.

The power detector (D1) detects transmit output power and converts it into DC voltage. The DC voltage is at a minimum level when the antenna impedance is matched to 50 Ω , and increased when mismatched.

The detected voltage is applied to the differential amplifier (IC2, pin 3), and the "T2" signal from the D/A converter (IC8, pin 23), controlled by the CPU (IC13), is applied to the other input for reference. When antenna impedance is mismatched, the detected voltage exceeds the power setting voltage. Then the output voltage of the differential amplifier (IC2, pin 4) controls the input current of the pre-drive (Q9), drive (Q8) and power (Q7) amplifiers to reduce the output power.

• APC CIRCUITS



4-3 PLL CIRCUITS

4-3-1 PLL CIRCUIT

A PLL circuit provides stable oscillation of the transmit frequency and receive 1st LO frequency. The PLL output compares the phase of the divided VCO frequency to the reference frequency. The PLL output frequency is controlled by the divided ratio (N-data) of a programmable divider.

The PLL circuit contains the TX/RX VCO circuits (TX: Q13, D16, D17, D21; RX: Q14, D19, D20, D22). The oscillated signal is amplified at the buffer amplifiers (Q11, Q12) and then applied to the PLL IC (IC4, pin 8) after being passed through the low-pass filter (L32, C206–C208).

The phase detected signal outputs from pins 15 and 16, and is then applied to the charge pump (Q39, Q40). The signal passes through the loop filter (C146, C147, C149, R95–R97), and is then applied to the TX and RX VCO circuits as a lock voltage.

The PLL IC contains a prescaler, programmable counter, programmable divider and phase detector, etc. The entered signal is divided at the prescaler and programmable counter section by the N-data ratio from the CPU. The divided signal is detected on phase at the phase detector using the reference frequency.

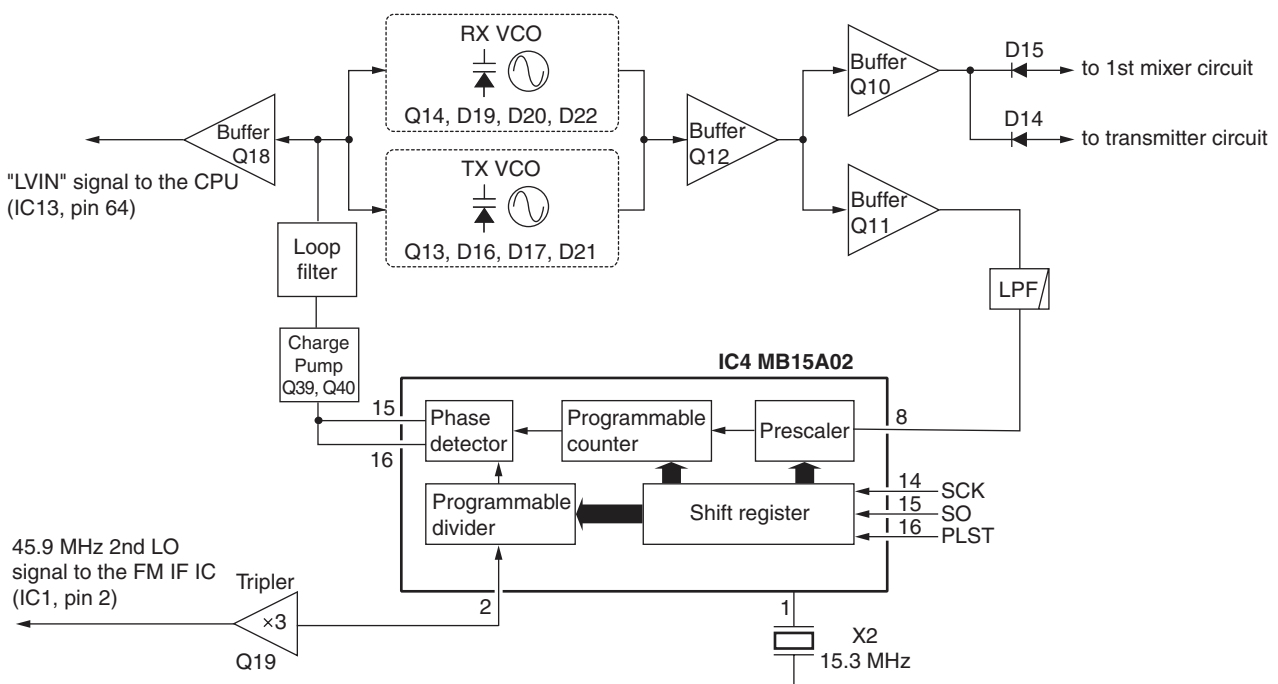
If the oscillated signal drifts, its phase changes from that of the reference frequency, causing a lock voltage change to compensate for the drift in the oscillated frequency.

4-3-2 VCO CIRCUIT

The VCO circuit contains a separate RX VCO (Q14, D19, D20) and TX VCO (Q13, D16, D17). The oscillated signal is amplified at the buffer amplifiers (Q10, Q12) and is then applied to the T/R switch (D14 for TX, D15 for RX). Then the receive 1st LO (RX) signal is applied to the 1st mixer circuit (Q3) and the transmit (TX) signal to the pre-drive amplifier (Q9).

A portion of the signal from the buffer amplifier (Q12) is fed back to the PLL IC (IC4, pin 8) via the buffer amplifier (Q11) and low-pass filter (L32, C206–C208) as the comparison signal.

PLL CIRCUITS



4-4 OTHER CIRCUITS

LED CONTROL CIRCUITS

The LED control circuit is composed of the CPU (IC13), LED driver (Q32) and LED (DS1).

The CPU outputs “RLED” and “TLED” signals from the pins 42 and 43. The signals are applied to the LED driver (Q32, pins 3 and 1). The driver outputs LED control signals to the LED (DS1).

CONDITION	COLOR
RECEIVING (2/5-TONE CODE)	ORANGE (Lighting)
LOW BATTERY (Nearly exhausted)	RED (Blinks Slowly)
LOW BATTERY (Almost exhausted)	RED (Blinks Fast)
CLONING	ORANGE (Blinking)
RECEIVING/SQUELCH OPEN	GREEN (Lighting)
TRANSMITTING	RED (Lighting)

4-5 POWER SUPPLY CIRCUIT

VOLTAGE LINE

LINE	DESCRIPTION
VCC	The voltage from the connected battery pack.
+5V	Common 5 V converted from the VCC line at the +5 regulator circuit (IC9). The output voltage is supplied to the D/A converter (IC8), analog SW (IC10) and so on.
S5V	Common 5 V converted from the VCC line at the S5 regulator circuit (Q23–Q25). The output voltage is supplied to the ripple filter (Q17), PLL IC (IC4), etc.
R5V	Receive 5 V converted from the S5V line at the R5 regulator circuit (Q22). The output voltage is supplied to the tripler (Q19), FM IF IC (IC1), IF amplifier (Q4), VCO switch (Q15, Q16), 1st mixer (Q3), etc.
T5V	Transmit 5 V converted from the S5V line at the T5 regulator circuit (Q21). The output voltage is supplied to the pre-drive (Q9), APC amplifier (IC2).

4-6 PORT ALLOCATION

4-6-1 D/A CONVERTER IC (IC8)

Pin number	Port name	Description
11	BAL	Outputs the modulation balance level control signal. The signal is applied to the buffer amplifier (IC7, pin 3).
23	T2	<ul style="list-style-type: none"> Outputs the bandpass filter tuning signal during receive. The output signal is applied to the bandpass filters (D9, D10). Outputs the TX power control signal during transmit. The output signal is applied to the APC amplifier (IC2, pin 1).
22	T1	Outputs the bandpass filter tuning signal. The output signal is applied to the bandpass filters (D4, D8).
14	LVA	Outputs the PLL lock voltage control signal. The output signal is applied to the buffer amplifier (IC7, pin 3).
15	REF	Outputs the reference oscillator correcting voltage. The voltage is applied to the buffer amplifier (IC7, pin 5).

4-6-2 CPU (IC13)

Pin number	Port name	Description
1	TEMP	Input port for the transceiver's internal temperature detecting signal.
2	BATV	Input port for the detect signal for connecting battery pack's voltage.
7	RES	Input port for power reset signal.
13	SENC0	Output single tone encoder signal.
14	SENC1	
16	DUSE	Outputs DTSC LPF control signal.
17	BUSY	
18	AFON	Outputs AF power amplifier control signal.
19	SENC2	Output single tone encoder signal.
20	SENC3	
21	CBI0	Input ports for ritary selectoir.
22	CBI1	
23	CENC0	Output CTCSS/DTCS signals.
24	CENC1	
25	CENC2	
26	CBI2	Input ports for ritary selectoir.
27	CBI3	
28	SCK	Outputs serial clock signal to the PLL IC (IC4, pin 9), D/A convertor (IC6, pin 7), etc.
29	SO	Outputs serial data to the PLL IC (IC6, pin 8) and D/A convertor (IC6, pin 8).
30	BEEP	Outputs beep audio signals.
31	ESDA	I/O port for data signals from/to the EEPROM (IC15, pin 5).
32	ESCL	Outputs clock signal to the EEPROM (IC15, pin 6).
33	UNLK	Input port for unlock signal from PLL IC.
34	PLST	Outputs strobe signals to the PLL IC (IC4, pin 11).
36	NWC	Output/input port for wide/narrow control signal.
37	DAST	<ul style="list-style-type: none"> Outputs strobe signals to the D/A convertor (IC8, pin 6). Input port for the connecting battery type detect signal.
38	S5C	Outputs power save control signal.
39	T5C	Outputs T5 regulator control signal. Low: While transmitting
40	R5C	Outputs R5 regulator control signal. Low: While receiving

Pin number	Port name	Description
42	RLED	Outputs receiving LED control signal.
43	TLED	Outputs transmitting LED control signal.
44	OPT3	I/O ports for option unit.
45	OPT1	
46	OPT2	
47	PTT	Input port for the PTT switch detection signal. Low : While the PTT switch is pushed.
48	SI	Serial Bus inputport.
49	CLI	Input port for the cloning data signal.
50	CLO	Outputs the cloning data signal.
53	NOIS	Input port for the noise signal from the FM IF IC (MAIN unit; IC1, pin 13).
54	CIRQ	Input port for option unit detection.
55	CCS	Outputs chip select signal.
56	TMUT	Outputs transmit mute signal.
57	RMUT	Input port for AF mute signal from the RX circuit.
58	MMUT	Outputs MIC mute signal.
59	REMO	Inputs key signal from remote mic.
60	CDEC	Input port for CTCSS/DTCS signal from the amplifier (IC5, pin 8).
61	SDEC	Input port for single tone decode signal from the LPF (IC5, pin 8).
62	KEY	Inputs key input signal.
63	RSSI	Input port for the S-meter signal from the FM IF IC (IC1, pin 12).
64	LVIN	Input port for the PLL lock voltage.

SECTION 5 ADJUSTMENT PROCEDURE

5-1 PREPARATION

■ REQUIRED EQUIPMENTS

EQUIPMENT	SPECIFICATION	EQUIPMENT	SPECIFICATION
Adjustment Software	"CS-F14 ADJ" (Revision 1.0 or later)	JIG cable (see the page 5-3)	Modified OPC-478U/UC (USB type) or OPC-478 (RS-232 type)
Audio Generator	Frequency range : 300–3000 Hz Output level : 1–500 mV	Attenuator	Power attenuation : 30 dB Capacity : More than 6 W
RF Power Meter (terminated type)	Measuring range : 1–6 W Frequency range : 100–300 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard Signal Generator (SSG)	Frequency range : 0.1–300 MHz Output level : 0.1 mV to 32 mV (–127 to –17 dBm)
Frequency Counter	Frequency range : 0.1–300 MHz Frequency accuracy : ± 1 ppm or better Input level : Less than 1 mW	AC Millivoltmeter	Measuring range : 10 mV to 10 V
		Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V
Modulation Analyzer	Frequency range : 30–300 MHz Measuring range : 0 to ± 10 kHz	External Speaker	Input impedance : 8 Ω Capacity : More than 5 W

■ SYSTEM REQUIREMENTS

- Microsoft® Windows® 98/SE/ME/2000/XP
- RS232C/USB port

■ BEFORE STARTING SOFTWARE ADJUSTMENT

Clone adjustment frequencies, TX power, CTCSS frequency, DTCS code and IF bandwidth into the transceiver using with the CS-F14 CLONING SOFTWARE before starting adjustment. See the next page for detail.

CAUTION!: BACK UP the originally programmed memory data in the transceiver before programming the adjustment frequencies.
When program the adjustment frequencies into the transceiver, the transceiver's memory data will be overwritten and lose original memory data at the same time.

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ADJUSTMENT CHANNELS

Create "icf" file/files for adjustment as below, then clone it into the transceiver before starting adjustment.

<For IC-F14/F15/F16/F3018>

- ① Create the icf file "F14 ADJ CH.icf."

"F14 ADJ CH.icf"

CH	Atr	Inh	RX	TX	TX Inh	W/N	RX	TX	TOT	RF PWR	S
1	AB		173.900000	<-		W				L1	0
2			136.100000	<-		W				L1	0
3			155.000000	<-		W				H	0
4			155.000000	<-		W				L2	0
5			155.000000	<-		W				L1	0
6			155.000000	<-		N				L1	0
7			155.000000	<-		N				L1	0
8			173.900000	<-		N		007N		L1	0
9			173.900000	<-		W		007N		L1	0
10			155.000000	<-		W		151.4		L1	0
11			136.100000	<-	i	W				L1	0
12			155.000000	<-	i	W				L1	0
13											
14											
15											
16											

- ② Clone the icf file into the transceiver.

<For IC-F14S/F15S/F16S>

- ① Assign MR-CH3/MR-CH4 to the [Upper]/[Lower] keys.

Key	Assign
Upper	MR-CH 3
Lower	MR-CH 4

Remote Mic	Assign
Mic Function	OFF
Mic Up	Null
Mic Down	Null
Mic A	Null

- ② Create five icf files as below.

"ADJ CH FREQ.icf"

CH	Atr	Inh	RX	TX	TX Inh	W/N	RX	TX	TOT	RF PWR	S
1	AB		173.900000	<-		W				L1	0
2			136.100000	<-		W				L1	0
3											
4											

"ADJ CH TXPWR.icf"

CH	Atr	Inh	RX	TX	TX Inh	W/N	RX	TX	TOT	RF PWR	S
1	AB		155.000000	<-		W				H	0
2			155.000000	<-		W				L2	0
3			155.000000	<-		W				L1	0
4											

"ADJ CH AudioMOD.icf"

CH	Atr	Inh	RX	TX	TX Inh	W/N	RX	TX	TOT	RF PWR	S
1	AB		155.000000	<-		N				L1	0
2			155.000000	<-		W				L1	0
3											
4											

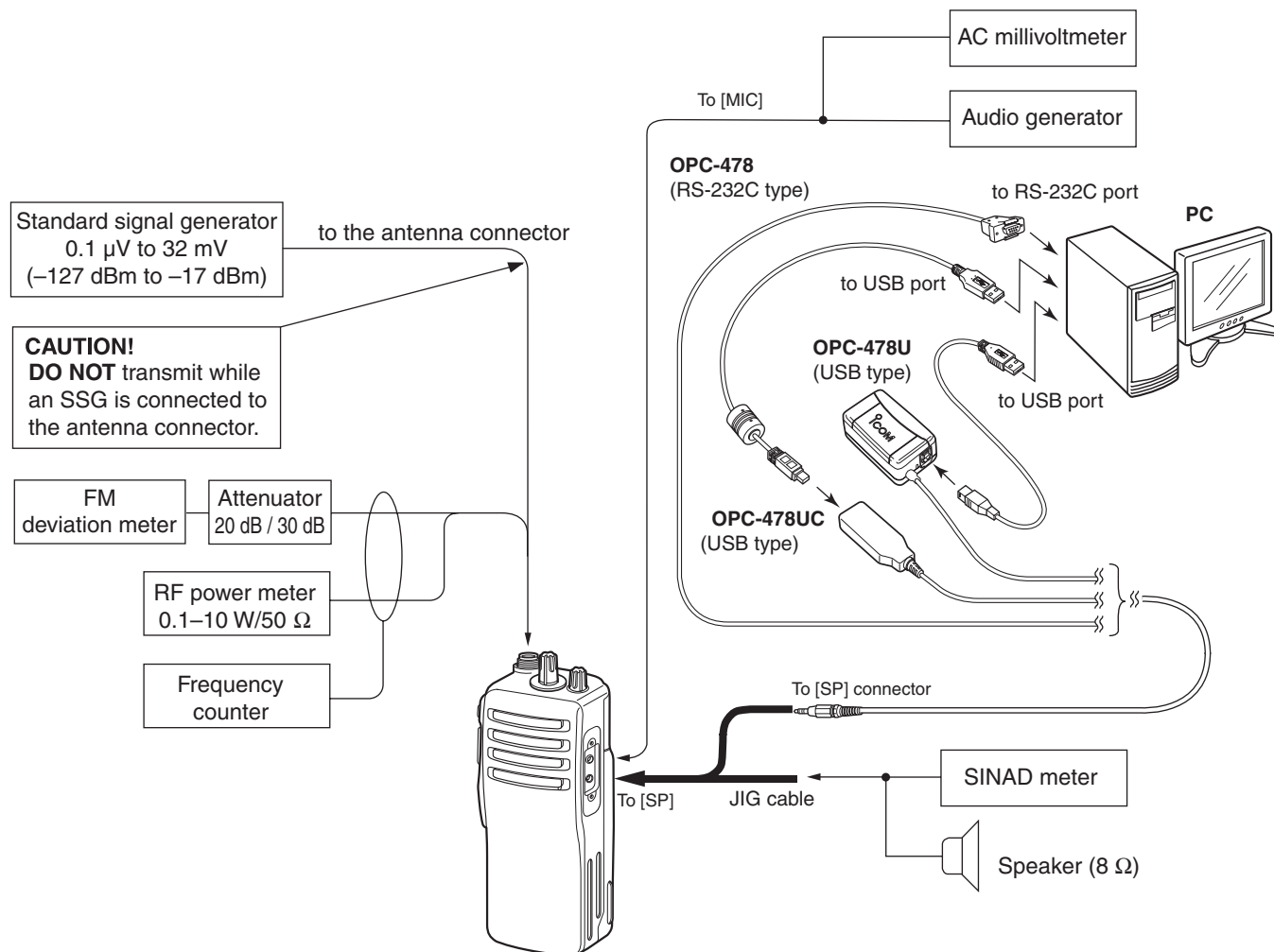
"ADJ CH ToneMOD.icf"

CH	Atr	Inh	RX	TX	TX Inh	W/N	RX	TX	TOT	RF PWR	S
1	AB		173.900000	<-		N		007N		L1	0
2			173.900000	<-		W		007N		L1	0
3			155.000000	<-		W		151.4		L1	0
4											

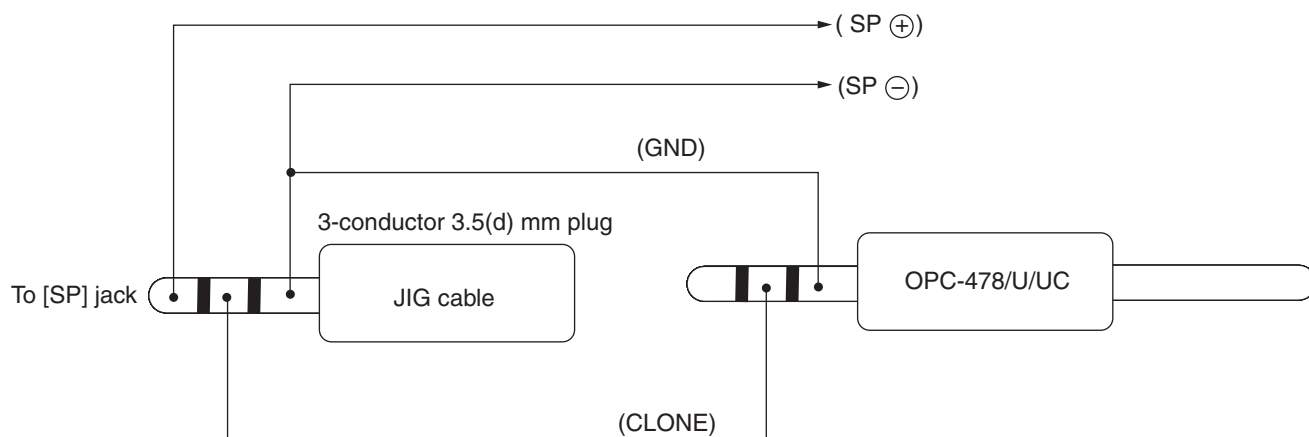
"ADJ CH RX.icf"

CH	Atr	Inh	RX	TX	TX Inh	W/N	RX	TX	TOT	RF PWR	S
1	AB		136.100000	<-	i	W				L1	0
2			155.000000	<-	i	W				L1	0
3											
4											

• CONNECTION



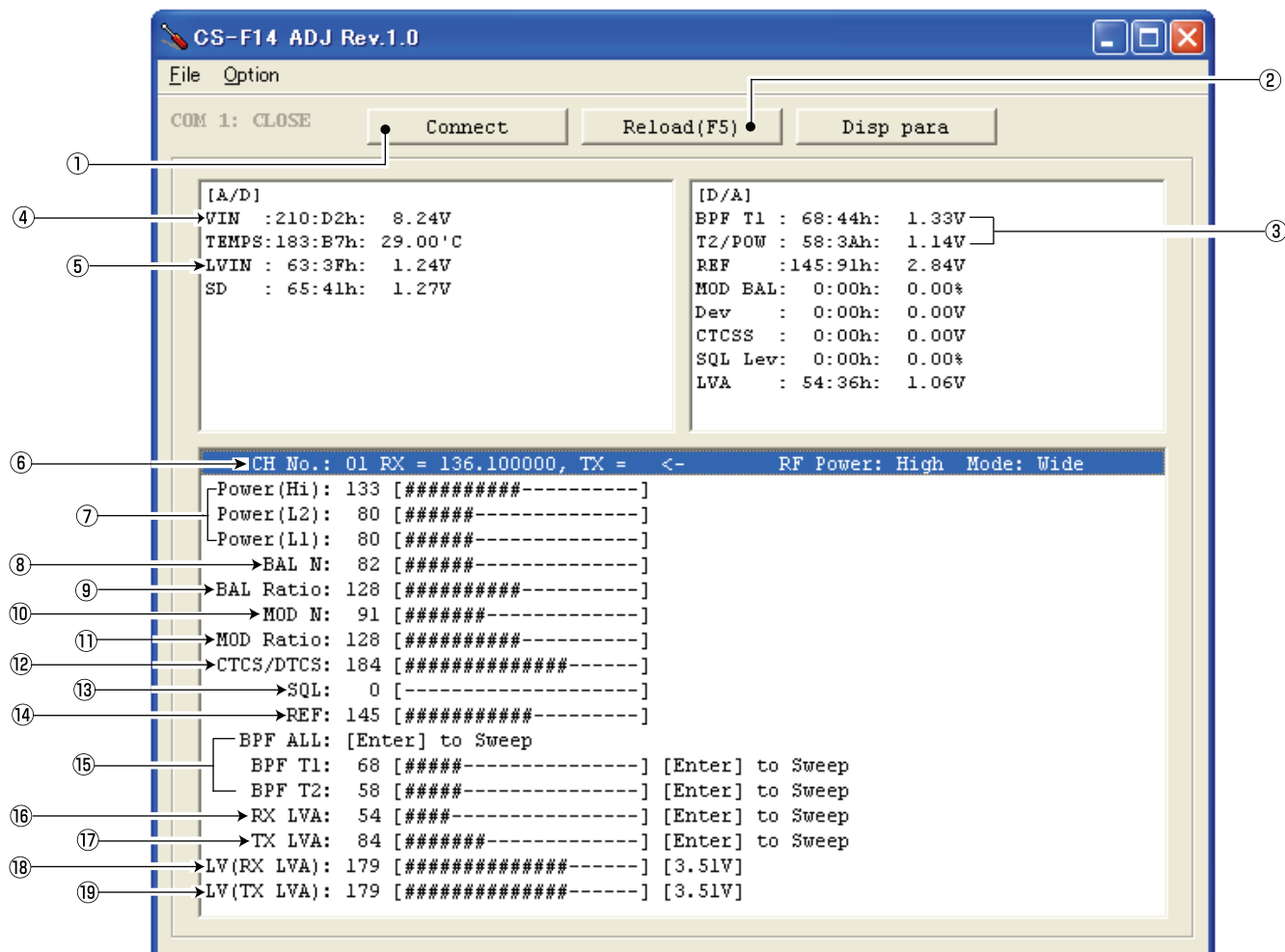
• JIG CABLE



■ STARTING SOFTWARE ADJUSTMENT

- (1) Connect the transceiver and PC with OPC-478/U/UC and JIG CABLE (see the previous page).
- (2) Turn the transceiver power ON.
- (3) Boot up Windows, and click the program group 'CS-F14 ADJ' in the 'Programs' folder of the [Start] menu, then CS-F14 ADJ's window appears.
- (4) Click 'Connect' on the CS-F14's window, then IC-F14's up-to-date condition appears as below.
- (5) Set or modify adjustment value as specified in following guidances.

• ADJUSTMENT WINDOW



NOTE: The above screen is an example.

Each transceiver has its own specific values for each setting.

- | | |
|-------------------------------------|--|
| ①: Transceiver's connection state | ⑫: CTCSS/DTCS deviation |
| ②: Reload adjustment data | ⑬: Squelch level |
| ③: Receive sensitivity measurement | ⑭: Reference frequency |
| ④: Connected DC voltage measurement | ⑮: Receive sensitivity (automatically) |
| ⑤: PLL lock voltage measurement | ⑯: PLL lock voltage for RX (automatically) |
| ⑥: Operating channel select | ⑰: PLL lock voltage for TX (automatically) |
| ⑦: RF output power | ⑱: PLL lock voltage for RX (manually) |
| ⑧: FM deviation balance (Narrow) | ⑲: PLL lock voltage for RX (manually) |
| ⑨: FM deviation balance (Wide) | |
| ⑩: FM deviation (Narrow) | |
| ⑪: FM deviation (Wide) | |

5-2 FREQUENCY ADJUSTMENT

1) Select an adjustment item using cursor or [↑] / [↓] keys of the PC's keyboard.


2) Set or modify the adjustment value as specified using [←] / [→] keys of the PC's keyboard, then push the [ENTER] key.

ADJUSTMENT		ADJUSTMENT CONDITION	OPERATION	ADJUSTMENT ITEM	VALUE
PLL LOCK VOLTAGE -Preparation-	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH FREQ.icf" into the transceiver.			
	2	• Connect an RF Power Meter to the antenna.	—	—	—
-Adjust- RX	2	• CH. (16CH/2CH) : CH.1/CH.1 • Receiving	• Monitoring lock voltage at the "LVIN" in the "ADJUSTMENT WINDOW" (see the previous page), adjust the [RX LVA] using [←] / [→] keys on the PC's keyboard. or • Set the [RX LVA] to "179", then push the [ENTER] key.	[RX LVA]	3.5 V (at the "LVIN" item) or "179" (at the [RX/TX LVA])
TX	3	• CH. (16CH/2CH) : CH.1/CH.1 • Transmitting	• Monitoring lock voltage at the "LVIN" in the "ADJUSTMENT WINDOW" (see the previous page), adjust the [TX LVA] using [←] / [→] keys on the PC's keyboard. or • Set the [TX LVA] to "179", then push the [ENTER] key.	[TX LVA]	
LOCK VOLTAGE VERIFICATION	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH FREQ.icf" into the transceiver.			
		• CH. (16CH/2CH) : CH.2/CH.2 • Receiving	• Verify the lock voltage at the "LVIN" in the "ADJUSTMENT WINDOW" (see the previous page).	[LVIN]	0.9–1.5 V (Verify)
		• CH. (16CH/2CH) : CH.2/CH.2 • Transmitting			3.0–4.0 V (Verify)
REFERENCE FREQUENCY	1	—	• Connect an RF Power Meter to the antenna.	—	—
	2	• CH. (16CH/2CH) : CH.1/CH.1 • Transmitting	1) Adjust the frequency using [←] / [→] keys on the PC's keyboard. 2) Push the [ENTER] key to store the adjust value.	[REF]	173.9000 MHz

5-3 TRANSMIT ADJUSTMENT

1) Select an adjustment item using cursor or [↑] / [↓] keys of the PC's keyboard.

2) Set or modify the adjustment value as specified using [←] / [→] keys of the PC's keyboard, then push the [ENTER] key.

ADJUSTMENT	ADJUSTMENT CONDITION	OPERATION	ADJUSTMENT ITEM	VALUE
TRANSMIT OUTPUT POWER -Preparation-	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH TXPWR.icf" into the transceiver.		
	—	• Connect an RF Power Meter to the antenna connector.	—	—
-Adjustment-Hi	2	1) Adjust the transmit output power using [←] / [→] keys on the PC's keyboard. 2) Push the [ENTER] key to store the adjust value.	[Power (Hi)]	5.0 W
L2	3		[Power (L2)]	2.0 W
L1	4		[Power (L1)]	1.0 W
DEVIATION -Preparation-	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH AudioMOD.icf" into the transceiver.		
	—	• Connect a Modulation Analyzer to the antenna connector through an Attenuator.	—	—
	2	• Set the Modulation Analyzer as; HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P-P)/2	—	—
	2	• Connect an Audio Generator to the MIC line through the JIG cable.	—	—
	3	• Set the Audio Generator as; Modulation : 1 kHz Level : 40 mV rms Wave form : Sine wave	—	—
-Adjustment-WIDE	3	1) Adjust the deviation using [←] / [→] keys on the PC's keyboard. 2) Push the [ENTER] key to store the adjust value.	[MOD Ratio]	±4.05—4.15 kHz
MIDDLE*	4		[MOD Ratio]	±3.15—3.25 kHz
NARROW	5		[MOD N]	±2.05—2.15 kHz
MODULATION BALANCE -Preparation-	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH ToneMOD.icf" into the transceiver.		
	—	• Connect a Modulation Analyzer to the antenna connector through an attenuator.	—	—
	—	• Set the Modulation Analyzer as; HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P-P)/2	—	—
	—	• Connect an Oscilloscope to the Detect terminal of the Modulation Analyzer.	—	—
-Adjustment-NARROW	2	1) Adjust the waveform using [←] / [→] keys on the PC's keyboard. 2) Push the [ENTER] key to store the adjust value.	[BAL N]	Square waveform
MIDDLE*	3		[BAL Ratio]	Flat
WIDE	4		[BAL Ratio]	
CTCSS/DTCS DEVIATION -Preparation-	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH ToneMOD.icf" into the transceiver.		
	—	• Connect a Modulation Analyzer to the antenna connector through an attenuator.	—	—
	—	• Set the Modulation Analyzer as; HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P-P)/2	—	—
-Adjustment-	2	• CH. (16CH/2CH) : CH.10/CH.3 • Transmitting	[CTCSS/DTCS]	±0.66—0.70 kHz

*: F15/S only

5-2 RECEIVE ADJUSTMENT

1) Select an adjustment item using cursor or [↑] / [↓] keys of the PC's keyboard.

2) Set or modify the adjustment value as specified using [←] / [→] keys of the PC's keyboard, then push the [ENTER] key.

ADJUSTMENT	ADJUSTMENT CONDITION	OPERATION	ADJUSTMENT ITEM	VALUE
RECEIVE SENSITIVITY -Preparation-	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH RX.icf" into the transceiver.		
		• Connect an SSG to the antenna connector.	• Set the SSG as; Frequency : 136.1000 MHz Level : +20 dBμ Modulation : 1 kHz Deviation : 3.5 kHz	–
-Adjustment-	2	• CH. (16CH/2CH) : CH.11/CH.1 • Receiving	1) Select the item [BPF (T1)] , then push the [ENTER] key. 2) Select the item [BPF (T2)] , then push the [ENTER] key.	[BPF (T1)] [BPF (T2)] (Automatic adjustment)
		CONVINIENT: [BPF (T1)] and [BPF (T2)] can be adjusted at same time as below.		
	2	• CH. (16CH/2CH) : CH.11/CH.1 • Receiving	• Select the item [BPF ALL] , then push the [ENTER] key.	[BPF ALL] (Automatic adjustment)
SQUELCH -Preparation-	1	<For IC-F14S/F15S/F16S only> Clone the "ADJ CH RX.icf" into the transceiver.		
		• Connect an SSG to the antenna connector.	• Set the SSG as; Frequency : 155.0000 MHz Level : -14 dBμ Modulation : 1 kHz Deviation : 3.5 kHz	–
-Adjustment-	2	• CH. (16CH/2CH) : CH.12/CH.2 • Receiving	1) Decrease the adjustment value [SQL] to close the squelch once, then increase the value to open the squelch. 2) Select the item [SQL] , then push the [ENTER] key to store the adjust value.	[SQL] (Automatic adjustment)

SECTION 6

PARTS LIST

[MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
IC1	1110003201	S.IC TA31136FNG (EL)	B	51.8/19
IC2	1110002751	S.IC TA75S01F (TE85R,F)	T	68.9/21
IC4	1140005991	S.IC MB15A02PFV1-G-BND-ERE1	T	38.3/35.7
IC5	1110005340	S.IC NJM12902V-TE1-#ZZZB	T	29.7/11.6
IC6	1110005320	S.IC NJM13403V-TE1-#ZZZB	T	16/34.6
IC7	1110005340	S.IC NJM12902V-TE1-#ZZZB	T	29.9/34.6
IC8	1190000350	S.IC M62363FP-650C	T	40.3/15.2
IC9	1110005350	S.IC NJM2870F05-TE1-#FZZB	B	84.2/14.2
IC10	1130011770	S.IC CD4066BPWR	T	22.9/34.6
IC12	1110001811	S.IC TA7368FG (5,ER)	T	89.6/13.6
IC13	1140012721	S.IC HD6433687C73FPV	T	12.5/14.3
IC14	1110006260	S.IC BD5242G-TR	T	6.6/5.9
IC15	1130011540	S.IC BR24L16FV-WE2	B	16/11.6
Q1	1560000841	S.FET 2SK1829 (TE85R,F)	T	75/39.5
Q2	1580000731	S.FET 3SK293 (TE85L,F)	B	77.8/37.9
Q3	1580000800	S.FET 3SK324UG-TL-E	B	66.2/37.9
Q4	1530003311	S.TR 2SC5107-O (TE85R,F)	B	51.4/23.1
Q6	1590003230	S.TR UNR9113J-(TX)	T	71.7/19.1
Q7	1560001232	S.FET RD07MVS2-T112	T	82.6/27
Q8	1560001241	S.FET RD01MUS1-T113	T	76.1/27.6
Q9	1530003421	S.TR 2SC5110-O (TE85R,F)	T	70.7/34.4
Q10	1530003311	S.TR 2SC5107-O (TE85R,F)	T	59.4/36.3
Q11	1530003311	S.TR 2SC5107-O (TE85R,F)	B	56.8/36.4
Q12	1530003311	S.TR 2SC5107-O (TE85R,F)	T	59.1/31.6
Q13	1530002920	S.TR 2SC4226-T1 R25	T	54.1/32.3
Q14	1530002920	S.TR 2SC4226-T1 R25	T	54.1/34.8
Q15	1590001400	S.TR XP1214 (TX)	B	56.5/32.6
Q16	1590003290	S.TR UNR9213J-(TX)	B	59.1/32.6
Q17	1530002851	S.TR 2SC4116-BL (TE85R,F)	T	55.5/44.1
Q18	1560000541	S.FET 2SK880-Y (T5RICOM,F)	B	51.5/39.2
Q19	1530002851	S.TR 2SC4116-BL (TE85R,F)	T	43.3/29.9
Q20	1560001360	S.FET 2SK3019-TL	T	27.7/29.4
Q21	1510000920	S.TR 2SA1577 T106 Q	T	71.9/16.4
Q22	1510000920	S.TR 2SA1577 T106 Q	T	24.9/25.9
Q23	1520000460	S.TR 2SB1132 T100 R	T	81.1/15.1
Q24	1590001190	S.TR XP6501-(TX) AB	T	76.5/15.1
Q25	1590003230	S.TR UNR9113J-(TX)	T	75.7/11.7
Q26	1590003290	S.TR UNR9213J-(TX)	T	49.6/18.4
Q27	1590003290	S.TR UNR9213J-(TX)	T	24.8/16.7
Q28	1590003430	S.TR UNR911HJ-(TX)	B	63.8/10.8
Q29	1590003270	S.TR UNR9213J-(TX)	B	36.1/9.4
Q30	1510001080	S.TR 2SA2048 TLR	T	91.9/8.5
Q31	1590001190	S.TR XP6501-(TX) AB	T	91.4/5.2
Q32	1590003020	S.TR KP4216-(TX)	T	16.5/23.5
Q33	1590003230	S.TR UNR9113J-(TX)	T	19.9/22.5
Q34	1560001360	S.FET 2SK3019-TL	T	11.6/31.9
Q35	1560001360	S.FET 2SK3019-TL	T	9.5/30.5
Q39	1530002060	S.TR 2SC4081 T106 R	B	39.1/42.7
Q40	1510000510	S.TR 2SA1576A T106R	B	39.1/40
Q41	1590003290	S.TR UNR9213J-(TX)	B	59.7/11.9
D1	1790001790	S.DIO RB876W TL	B	93.6/17.6
D2	1750000581	S.DIO 1SV307 (TPH3,F)	B	91.5/31.1
D4	1750000721	S.VCP HVC375BTRF-E	B	80.3/33.4
D5	1750000581	S.DIO 1SV307 (TPH3,F)	B	87.6/33.4
D6	1790001260	S.DIO MA2S077-(TX)	B	86.7/35.9
D8	1750000721	S.VCP HVC375BTRF-E	B	83/33.4
D9	1750000711	S.VCP HVC350BTRF-E	B	73.6/37.7
D10	1750000711	S.VCP HVC350BTRF-E	B	72.3/37.7
D14	1790001260	S.DIO MA2S077-(TX)	T	65.8/35.3
D15	1790001260	S.DIO MA2S077-(TX)	T	65.8/36.7
D16	1750000771	S.VCP HVC376BTRF-E	T	55.1/28.8
D17	1750000771	S.VCP HVC376BTRF-E	T	53.7/28.8
D18	1720000471	S.VCP 1SV239 (TPH3,F)	B	49.6/28.2
D19	1750000771	S.VCP HVC376BTRF-E	T	53.6/37.8
D20	1750000771	S.VCP HVC376BTRF-E	T	50.9/37.5
D21	1750000721	S.VCP HVC375BTRF-E	T	49.2/31.5
D22	1750000721	S.VCP HVC375BTRF-E	T	49.2/34.9
D23	1790001250	S.DIO MA2S111-(TX)	T	70.5/40.4
D24	1790001250	S.DIO MA2S111-(TX)	T	41.5/39.2
D26	1790001790	S.DIO RB876W TL	B	36.1/7.3
D27	1750000520	S.DIO DAN222TL	B	21.3/6.5
D28	1790001260	S.DIO MA2S077-(TX)	B	8.5/11.2
D29	1750000940	S.DIO ISS400 TE61	B	21.5/4.2
D30	1790001260	S.DIO MA2S077-(TX)	T	28.6/42.4
F11	2030000150	S.MLH FL-335 (46.350 MHz)	B	62.7/27.1
F12	2020001840	CER ALFYM450F=K		
X1	6070000191	S.DCR CDBKB450KAY24-R0	T	54.4/20
X2	6050011940	S.XTL CR-783 (15.3 MHz)	T	36.9/28.9
X3	6050011720	S.XTL CR-764 (19.608 MHz)	B	12/5.9
L1	6200012780	S.COL 0.30-1.4-6TL 27.2N <COMO>	B	94.9/40.3
L2	6200012470	S.COL 0.30-1.7-7TL 45.3N <COMO>	B	94.6/36.2
L3	6200012910	S.COL 0.35-1.6-8TL 45.5N <COMO>	B	94.6/31.9
L4	6200012470	S.COL 0.30-1.7-7TL 45.3N <COMO>	B	92.5/25.7
L5	6200012390	S.COL 0.30-0.92-3TR 5.8N <COMO>	B	89.8/19.8
L6	6200012470	S.COL 0.30-1.7-7TL 45.3N <COMO>	B	89.5/36.5
L7	6200007871	S.COL ELJRF 39NJFB	B	86.8/37.7
L8	6200008090	S.COL LQW2BHN68NJ03L	B	83.9/35.2
L9	6200008090	S.COL LQW2BHN68NJ03L	B	79.6/35.2

[MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
L10	6200007750	S.COL LQW2BHN56NJ03L	B	76.4/35
L11	6200007750	S.COL LQW2BHN56NJ03L	B	70.6/37.8
L12	6200008090	S.COL LQW2BHN68NJ03L	B	64/40.2
L13	6200007850	S.COL ELJNC R82K-F	B	66.8/33.9
L15	6200002861	S.COL NLV25T-4R7J	T	93.2/31.7
L16	6200012400	S.COL 0.30-0.91-4TL 8.6N <COMO>	B	86.2/20.8
L17	6200013100	S.COL 0.45-1.5-5TL 18.3N <COMO>	B	81.2/20.8
L18	6200005701	S.COL ELJRE 22NGFA	T	79/22.5
L19	6200010401	S.COL ELJRE 39NJFA	T	73/32.9
L20	6200003590	S.COL EXCCL3225U1	B	81.5/17.6
L21	6200011031	S.COL ELJRF R10JFB	T	59.2/38.6
L22	6200011031	S.COL ELJRF R10JFB	T	59.9/29.8
L23	6200011031	S.COL ELJRF R10JFB	B	55.9/38.3
L24	6200003640	S.COL MLF1608E 100K-T	T	49.3/27.5
L25	6200007760	S.COL LQW2BHN82NJ03L	T	50.1/29.3
L26	6200008090	S.COL LQW2BHN68NJ03L	T	48.5/38
L27	6200007170	S.COL MLF1608A 3R3K-T	B	52.2/30.9
L28	6200007170	S.COL MLF1608A 3R3K-T	B	52.2/35.5
L31	6200011021	S.COL ELJRF 82NJFB	B	83.4/38.7
L32	6200007881	S.COL ELJRF 33NJFB	B	55.9/42.3
L33	6200004480	S.COL MLF1608D R82K-T	T	43.4/25.9
L35	6200003540	S.COL MLF1608D R22K-T	T	41.7/31.8
L37	6200003640	S.COL MLF1608E 100K-T	T	53.7/39.1
L38	6200008090	S.COL LQW2BHN68NJ03L	T	57.9/27.7
L39	6200007720	S.COL LQW2BHN33NJ03L	T	55.9/38
L42	6200007170	S.COL MLF1608A 3R3K-T	B	48.5/34.1
L43	6200007170	S.COL MLF1608A 3R3K-T	B	48.5/30.9
R1	7030003540	S.RES ERJ3GEYJ 682 V (6.8 k)	B	93.6/20.2
R2	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	73.3/19.4
R3	7030005530	S.RES ERJ2GEJ 100 X (10)	T	66.7/22.8
R4	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	75.3/21.1
R5	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	73.3/21.1
R6	7030005070	S.RES ERJ2GEJ 683 X (68 k)	T	66.7/17.7
R7	7030005310	S.RES ERJ2GEJ 124 X (120 k)	T	68/17.7
R8	7030005110	S.RES ERJ2GEJ 224 X (220 k)	T	71.3/21.1
R9	7030004980	S.RES ERJ2GEJ 101 X (100 k)	T	70.3/23.9
R10	7030005030	S.RES ERJ2GEJ 152 X (1.5 k)	B	73.2/19.9
R11	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	82.3/34.7
R12	7030005530	S.RES ERJ2GEJ 100 X (10)	T	77.1/36.7
R13	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	80.6/34.7
R14	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	80.6/35.7
R15	7030005310	S.RES ERJ2GEJ 124 X (120 k)	B	79.8/39
R16	7030008280	S.RES ERJ2GEJ 271 X (270)	B	74.8/39.9
R17	7030004970	S.RES ERJ2GEJ 470 X (47)	B	74.8/33.9
R18	7030005530	S.RES ERJ2GEJ 100 X (10)	T	79.9/36.7
R19	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	78.8/37.7
R20	7030008370	S.RES ERJ2GEJ 561 X (560)	B	72.9/40.4
R21	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	72.2/38.9
R22	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	70.2/38.9
R23	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	71.2/38.9
R24	7030005120	S.RES ERJ2GEJ 102 X (1 k)	T	64.6/38
R25	7030005080	S.RES ERJ2GEJ 823 X (82 k)	B	68/37.8
R26	7030005000	S.RES ERJ2GEJ 471 X (470)	B	68.5/40.1
R27	7030005000	S.RES ERJ2GEJ 471 X (470)	B	66/41.7
R28	7030005530	S.RES ERJ2GEJ 100 X (10)	B	66/40.8
R29	7030005590	S.RES ERJ2GEJ 680 X (68)	B	64.2/35.1
R30	7030005000	S.RES ERJ2GEJ 471 X (470)		
			[RUS-02], [RUS-05] only	
R31	7030007250	S.RES ERJ2GEJ 220 X (22)	B	67.7/35.7
R32	7030010040	S.RES ERJ2GEJ-JPW	B	64.2/32.1
R33	7030007270	S.RES ERJ2GEJ 151 X (150)	B	66.1/31.1
			[RUS-02], [RUS-05] only	
R34	7030008300	S.RES ERJ2GEJ 184 X (180 k)	B	55.7/24.8
R35	7030004980	S.RES ERJ2GEJ 101 X (100)	B	52.5/25.2
R36	7030008410	S.RES ERJ2GEJ 392 X (3.9 k)	T	50.5/15.5
R37	7030009140	S.RES ERJ2GEJ 272 X (2.7 k)	T	50.7/16.3
R38	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	46.5/21
R39	7030004970	S.RES ERJ2GEJ 470 X (47)	B	55.8/22.3
R40	7030005030	S.RES ERJ2GEJ 152 X (1.5 k)	B	56.2/21.1
R42	7030005240	S.RES ERJ2GEJ 473 X (47 k)	B	51.8/15.4
R43	7030005000	S.RES ERJ2GEJ 471 X (470)	B	47.5/15.4
R44	7030006610	S.RES ERJ2GEJ 394 X (390 k)	B	54.8/16.1
R45	7030005090	S.RES ERJ2GEJ 104 X (100 k)	B	52.8/13.7
R46	7030007290	S.RES ERJ2GEJ 222 X (2.2 k)	B	53.8/13.7
R48	7030005010	S.RES ERJ2GEJ 681 X (680)	B	51.5/25.2
R50	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	66.3/38
R51	7030003670	S.RES ERJ3GEYJ 823 V (82 k)	B	97.3/41
R52	7030003350	S.RES ERJ3GEYJ 181 V (180)	T	93.1/34.9
R53	7030007250	S.RES ERJ2GEJ 220 X (22)	T	80.2/22.9
R54	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	81.5/21.8
R55	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	79/20.8
R57	7030005590	S.RES ERJ2GEJ 680 X (68)	T	74.3/23.9
R58	7030005060	S.RES ERJ2GEJ 333 X (33 k)	T	72.3/23.9
R59	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	71.3/37.4
R61	7030005530	S.RES ERJ2GEJ 100 X (10)	T	71.4/36.2
R62	7030004980	S.RES ERJ2GEJ 101 X (100)	T	68.7/32.3
R63	7030005000	S.RES ERJ2GEJ 471 X (470)	T	68.1/35.2
R65	7030007290	S.RES ERJ2GEJ 222 X (2.2 k)	T	68.7/33.9
R67	7030004980	S.RES ERJ2GEJ 101 X (100)	T	65.6/34.1
R68	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	65.6/33.1
R69	7030005120	S.RES ERJ2GEJ 102 X (1 k)	B	61.4/36.1
R70	7030004980	S.RES ERJ2GEJ 101 X (100)	B	57.7/39.3
R71	7030005310	S.RES ERJ2GEJ 124 X (120 k)	T	58.1/38.6
R72	7030009320	S.RES ERJ2GEJ 4R7 X (4.7)	T	59.9/37.4
R75	7030005110	S.RES ERJ2GEJ 224 X (220 k)	B	58.6/37
R76	7030004980	S.RES ERJ2GEJ 101 X (100)	B	57.7/38.3

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REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
R77	7030004980	S.RES ERJ2GEJ 101 X (100)	B	57.5/30.5
R78	7030005310	S.RES ERJ2GEJ 124 X (120 k)	T	58.2/33.4
R79	7030008340	S.RES RR0510P-182-D (1.8 k)	T	53.7/36.6
R80	7030005050	S.RES ERJ2GEJ 103 X (10 k)	B	56.5/30.5
R81	7030010040	S.RES ERJ2GEJ-JPW	T	51.7/35.3
R82	7030009320	S.RES ERJ2GEJ 4R7 X (4.7)	T	51.7/32.8
R83	7030008340	S.RES RR0510P-182-D (1.8 k)	T	53.6/30.5
R84	7030011000	S.RES RR0510P-392-D (3.9 k)	T	50.4/32.8
R85	7030011000	S.RES RR0510P-392-D (3.9 k)	T	50.4/34.5
R86	7030005090	S.RES ERJ2GEJ 104 X (100 k)	B	47.5/26.9
R87	7030008370	S.RES ERJ2GEJ 561 X (560)	B	54.6/34.1
R88	7030008370	S.RES ERJ2GEJ 561 X (560)	B	54.6/32.4
R89	7030005050	S.RES ERJ2GEJ 103 X (10 k)	B	50.8/36.8
R90	7030005110	S.RES ERJ2GEJ 224 X (220 k)	B	47.5/25.2
R91	7030005060	S.RES ERJ2GEJ 333 X (33 k)	B	46.5/23.5
R92	7030005090	S.RES ERJ2GEJ 104 X (100 k)	B	46.5/25.2
R93	7030005120	S.RES ERJ2GEJ 102 X (1 k)	T	39.8/39.4
R94	7030005100	S.RES ERJ2GEJ 154 X (150 k)	T	43.3/37.7
R95	7030005120	S.RES ERJ2GEJ 102 X (1 k)	B	50.8/35.8
R96	7030009270	S.RES ERJ2GEJ 821 X (820)	B	49.4/36.3
R97	7030008280	S.RES ERJ2GEJ 271 X (270)	B	47/36.8
R98	7030007290	S.RES ERJ2GEJ 222 X (2.2 k)	T	53.7/44.2
R100	7030005050	S.RES ERJ2GEJ 103 X (10 k)	B	53.6/38.3
R101	7030005120	S.RES ERJ2GEJ 102 X (1 k)	B	51.4/42.3
R102	7030005700	S.RES ERJ2GEJ 274 X (270 k)	T	32.3/27.8
R103	7030005160	S.RES ERJ2GEJ 105 X (1 M)	T	32.3/29.8
R104	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	30.6/29.8
R105	7030005100	S.RES ERJ2GEJ 154 X (150 k)	T	30.6/28.8
R106	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	38.1/31.4
R107	7030004970	S.RES ERJ2GEJ 470 X (47)	B	55.9/43.3
R108	7030005070	S.RES ERJ2GEJ 683 X (68 k)	T	44.9/21
R109	7030008300	S.RES ERJ2GEJ 184 X (180 k)	T	43.9/21
R110	7030005240	S.RES ERJ2GEJ 473 X (47 k)	B	6.1/27.6
R111	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	29.3/28.9
R113	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	B	47/31.7
R115	7030005120	S.RES ERJ2GEJ 102 X (1 k)	T	40.5/32
R116	7030007060	S.RES ERJ2GEJ 684X (680 k)	T	43.4/32.7
R117	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	35.3/40.1
R118	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	37/40.1
R121	7030005110	S.RES ERJ2GEJ 224 X (220 k)	T	77.1/35.7
R122	7030008290	S.RES ERJ2GEJ 183 X (18 k)	T	77.1/38.7
R123	7030009290	S.RES ERJ2GEJ 562 X (5.6 k)	T	75.7/37.2
R124	7030005170	S.RES ERJ2GEJ 474 X (470 k)	T	72.7/40.4
R125	7030005230	S.RES ERJ2GEJ 334 X (330 k)	T	73.2/38.9
R131	7510001730	S.TMR ERTJOEP 473J	T	40.9/28.1
R132	7030010080	S.RES ERJ2RHD 104 X (100 k)	T	49.9/27.1
R133	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	84.2/14.1
R134	7030007290	S.RES ERJ2GEJ 222 X (2.2 k)	T	76.2/16.9
R135	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	24.5/24
R136	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	22.5/24
R137	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	69.8/14.7
R138	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	69.8/16.7
R140	7030010040	S.RES ERJ2GEJ-JPW	T	37.1/20.3
R141	7030005000	S.RES ERJ2GEJ 471 X (470)	T	37.1/9.8
R142	7030005000	S.RES ERJ2GEJ 471 X (470)	T	42.9/9.8
R143	7030007340	S.RES ERJ2GEJ 153 X (15 k)	T	37.1/22.8
R144	7030005120	S.RES ERJ2GEJ 102 X (1 k)	B	46.5/13.7
R145	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	33.4/18.1
R146	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	31.6/18.1
R147	7030007350	S.RES ERJ2GEJ 393 X (39 k)	T	33.4/16.1
R148	7030005080	S.RES ERJ2GEJ 823 X (82 k)	T	31.6/16.1
R149	7030006610	S.RES ERJ2GEJ 394 X (390 k)	T	33.4/12.9
R150	7030008300	S.RES ERJ2GEJ 184 X (180 k)	T	33.4/11.9
R151	7030005030	S.RES ERJ2GEJ 152 X (1.5 k)	T	33.4/13.9
R152	7030005220	S.RES ERJ2GEJ 223 X (22 k)	T	32.3/41.1
R153	7030005220	S.RES ERJ2GEJ 223 X (22 k)	T	32.3/40.1
R154	7030005220	S.RES ERJ2GEJ 223 X (22 k)	T	30.6/40.1
R155	7030007300	S.RES ERJ2GEJ 332 X (3.3 k)	T	28.6/41.1
R156	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	28.6/40.1
R157	7030007290	S.RES ERJ2GEJ 222 X (2.2 k)	T	26.9/39.1
R159	7030008010	S.RES ERJ2GEJ 123 X (12 k)	T	16/28.8
R160	7030004980	S.RES ERJ2GEJ 101 X (100)	B	7.1/31.5
R161	7030005040	S.RES ERJ2GEJ 472 X (4.7 k)	T	14.3/26.8
R162	7030005290	S.RES ERJ2GEJ 682 X (6.8 k)	T	9/32.6
R163	7030005050	S.RES ERJ2GEJ 103 X (10 k)	T	14.3/29.8
R164	7030008410	S.RES ERJ2GEJ 392 X (3.9 k)	T	12.6/27.8
R165	7030008410	S.RES ERJ2GEJ 392 X (3.9 k)	T	10/34.4
R166	7030005240	S.RES ERJ2GEJ 473 X (47 k)	T	12.6/36.1
R167	7030009290	S.RES ERJ2GEJ 562 X (5.6 k)	T	16/29.8
R168	7030005000	S.RES ERJ2GEJ 471 X (470)	T	13/39.2
R169	7030005100	S.RES ERJ2GEJ 154 X (150 k)	T	15.4/39.9
R170	7030008010	S.RES ERJ2GEJ 123 X (12 k)	T	12.6/29.8
R171	7030005100	S.RES ERJ2GEJ 154 X (150 k)	T	11.6/36.1
R172	7030005700	S.RES ERJ2GEJ 274 X (270 k)	T	17.4/39.9
R173	7030005310	S.RES ERJ2GEJ 124 X (120 k)	T	19.4/26.8
R174	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	19.4/28.8
R175	7030005110	S.RES ERJ2GEJ 224 X (220 k)	T	19.4/27.8
R176	7030005310	S.RES ERJ2GEJ 124 X (120 k)	T	17.7/27.8
R177	7030005060	S.RES ERJ2GEJ 333 X (33 k)	T	17.7/28.8
R178	7030007270	S.RES ERJ2GEJ 151 X (150)	T	19.4/30.7
R179	7030005120	S.RES ERJ2GEJ 102 X (1 k)	B	11.4/17
R180	7030005160	S.RES ERJ2GEJ 105 X (1 M)	T	24.7/40.1
R181	7030005240	S.RES ERJ2GEJ 473 X (47 k)	T	21.1/40.1
R182	7030005090	S.RES ERJ2GEJ 104 X (100 k)	T	24.7/39.1
R183	7030006020	S.RES RR0510P-682-D (6.8 k)	B	17.6/39.5
R184	7030008250	S.RES RR0510P-562-D (5.6 k)	B	17.6/41.2
R185	7030005100	S.RES ERJ2GEJ 154 X (150 k)	B	18.6/41.2
R186	7030005310	S.RES ERJ2GEJ 124 X (120 k)	T	19.4/29.8
R187	7030005120	S.RES ERJ2GEJ 102 X (1 k)	B	9.2/18.2
R190	7030007280	S.RES ERJ2GEJ 331 X (330)	T	34.7/21.6
R191	7030008300	S.RES ERJ2GEJ 184 X (180 k)	T	18/4.1
R192	7030005720	S.RES ERJ2GEJ 563 X (56 k)	T	18/5.1
R193	7030005220	S.RES ERJ2GEJ 223 X (22 k)	T	18/6.1
R194	7030005220	S.RES ERJ2GEJ 223 X (22 k)	T	23.9/10.9

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REF NO.	PARTS NO.	DESCRIPTION		M.	H/V LOCATION
R195	7030005050	S.RES	ERJ2GEJ 103 X (10 k)	T	19.7/4.1
R196	7030005240	S.RES	ERJ2GEJ 473 X (47 k)	T	23.9/11.9
R197	7030005240	S.RES	ERJ2GEJ 473 X (47 k)	T	23.9/12.9
R198	7030005240	S.RES	ERJ2GEJ 473 X (47 k)	T	25.7/12.9
R200	7030005040	S.RES	ERJ2GEJ 472 X (4.7 k)	T	25.7/14.9
R201	7030005240	S.RES	ERJ2GEJ 473 X (47 k)	T	23.9/14.9
R206	7030005110	S.RES	ERJ2GEJ 224 X (220 k)	T	13.4/4.1
R207	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	T	13.4/5.1
R208	7030005240	S.RES	ERJ2GEJ 473 X (47 k)	T	15.6/5.1
R209	7030005220	S.RES	ERJ2GEJ 223 X (22 k)	T	15.6/6.1
R210	7030008010	S.RES	ERJ2GEJ 123 X (12 k)	T	15.6/4.1
R211	7030005070	S.RES	ERJ2GEJ 683 X (68 k)	T	27.1/4.1
R212	7030005070	S.RES	ERJ2GEJ 683 X (68 k)	T	27.1/5.1
R213	7030005070	S.RES	ERJ2GEJ 683 X (68 k)	T	27.1/6.1
R214	7030005070	S.RES	ERJ2GEJ 683 X (68 k)	T	29/7.1
R215	7030005070	S.RES	ERJ2GEJ 683 X (68 k)	T	30.8/6.1
R220	7030004980	S.RES	ERJ2GEJ 101 X (100)	B	16.1/22.5
R221	7030004980	S.RES	ERJ2GEJ 101 X (100)	B	66.5/13.7
R222	7030005060	S.RES	ERJ2GEJ 333 X (33 k)	B	64.4/8.7
R222	7030005220	S.RES	ERJ2GEJ 223 X (22 k)	B	64.4/8.7
R223	7030005060	S.RES	ERJ2GEJ 333 X (33 k)	B	61.7/11.1
R224	7030005000	S.RES	ERJ2GEJ 471 X (470)	B	75.5/10.3
R225	7030004980	S.RES	ERJ2GEJ 101 X (100)	B	33.9/6.8
R226	7210003061	VAR	TP76N00N-15F-A103-2251A		
R227	7030005050	S.RES	ERJ2GEJ 103 X (10 k)	T	95/14
R228	7030005120	S.RES	ERJ2GEJ 102 X (1 k)	T	94.5/15.2
R229	7030005530	S.RES	ERJ2GEJ 100 X (10)	T	86.4/10.1
R230	7030005530	S.RES	ERJ2GEJ 100 X (10)	T	86.3/16.4
R231	7030005120	S.RES	ERJ2GEJ 102 X (1 k)	T	90.6/2.8
R232	7030007300	S.RES	ERJ2GEJ 332 X (3.3 k)	T	93.2/4.3
R233	7030007300	S.RES	ERJ2GEJ 332 X (3.3 k)	T	92.6/2.8
R234	7030005100	S.RES	ERJ2GEJ 154 X (150 k)	B	23/6.4
R235	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	20.3/4.2
R236	7030005230	S.RES	ERJ2GEJ 334 X (330 k)	B	23/4.2
R237	7030009290	S.RES	ERJ2GEJ 562 X (5.6 k)	T	21.1/39.1
R238	7410001140	S.ARY	EXB28V104JX	B	40.9/9.7
R240	7030005590	S.RES	ERJ2GEJ 680 X (68)	T	99.7/13.1
R241	7030010040	S.RES	ERJ2GEJ-JPW	[2CH] only	39.4/7.1
R242	7030010040	S.RES	ERJ2GEJ-JPW	[2CH] only	41.4/7.1
R251	7030008010	S.RES	ERJ2GEJ 123 X (12 k)	B	5.9/9.1
R252	7030005530	S.RES	ERJ2GEJ 100 X (10)	B	13.7/9.1
R254	7030008010	S.RES	ERJ2GEJ 123 X (12 k)	B	9.3/10.1
R255	7030008010	S.RES	ERJ2GEJ 123 X (12 k)	B	7.6/10.1
R256	7030005050	S.RES	ERJ2GEJ 103 X (10 k)	T	6/8.5
R257	7030005120	S.RES	ERJ2GEJ 102 X (1 k)	T	9/22.1
R258	7410001140	S.ARY	EXB28V104JX	T	6.6/20.6
R259	7030005120	S.RES	ERJ2GEJ 102 X (1 k)	T	21.6/22.1
R260	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	T	20.1/24.7
R261	7410001130	S.ARY	EXB28V102JX	T	19.4/19.9
R262	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	T	21.3/13.9
R263	7030005050	S.RES	ERJ2GEJ 103 X (10 k)	T	21.3/12.9
R264	7030005240	S.RES	ERJ2GEJ 473 X (47 k)	T	21.3/10.9
R265	7410001130	S.ARY	EXB28V102JX	T	19.7/9.2
R266	7030007340	S.RES	ERJ2GEJ 153 X (15 k)	T	5.7/18.8
R271	7030005160	S.RES	ERJ2GEJ 105 X (1 M)	B	9.5/39.5
R272	7030005160	S.RES	ERJ2GEJ 105 X (1 M)	B	10.5/39.5
R273	7030005160	S.RES	ERJ2GEJ 105 X (1 M)	B	11.5/39.5
R274	7030005070	S.RES	ERJ2GEJ 683 X (68 k)	B	14.5/39.5
R275	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	12.5/39.5
R276	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	7.5/39.5
R277	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	8.5/39.5
R278	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	13.5/39.5
R280	7030005050	S.RES	ERJ2GEJ 103 X (10 k)	B	16.4/35.8
R284	7030004980	S.RES	ERJ2GEJ 101 X (100)	B	16/26.2
R287	7030007280	S.RES	ERJ2GEJ 331 X (330)	T	18.5/24.7
R288	7030005030	S.RES	ERJ2GEJ 152 X (1.5 k)	T	14.7/22.7
R291	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	5.9/12.5
R292	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	7.6/12.5
R293	7030008290	S.RES	ERJ2GEJ 183 X (18 k)	T	61.4/43.4
R294	7030005600	S.RES	ERJ2GEJ 273 X (27 k)	T	60.4/43.4
R295	7030005240	S.RES	ERJ2GEJ 473 X (47 k)	B	95.1/43.4
R301	7030004980	S.RES	ERJ2GEJ 101 X (100)	B	37.1/41.2
R302	7030004980	S.RES	ERJ2GEJ 101 X (100)	B	37.1/43.1
R303	7030009290	S.RES	ERJ2GEJ 562 X (5.6 k)	B	36.1/41.2
R304	7030009290	S.RES	ERJ2GEJ 562 X (5.6 k)	B	36.1/43.1
R305	7030005050	S.RES	ERJ2GEJ 103 X (10 k)	B	36.1/39.5
R306	7030005050	S.RES	ERJ2GEJ 103 X (10 k)	B	35.1/41.2
R307	7030003350	S.RES	ERJ3GEYJ 181 V (180)	T	94.4/34.9
R308	7030005310	S.RES	ERJ2GEJ 124 X (120 k)	B	64.2/38.1
R309	7030005100	S.RES	ERJ2GEJ 154 X (150 k)	B	62.5/38.1
R310	7030005090	S.RES	ERJ2GEJ 104 X (100 k)	B	62.2/40.8
R312	7030010040	S.RES	ERJ2GEJ-JPW	B	30.1/33.8
C2	4030017620	S.CER	ECJ0EC1H100C	B	94.5/38.5
C3	4030017410	S.CER	ECJ0EC1H240J	B	96.5/36.2
C4	4030017380	S.CER	ECJ0EC1H050B	B	92.7/36.2
C5	4030017650	S.CER	ECJ0EC1H270J	B	96.3/33.9
C6	4030017460	S.CER	ECJ0EB1E102K	B	92.8/33.9
C7	4030017460	S.CER	ECJ0EB1E102K	B	93.5/29.5
C8	4030017390	S.CER	ECJ0EC1H180J	B	93.3/28.2
C9	4030017640	S.CER	ECJ0EC1H150J	B	93.3/23.2
C10	4030017460	S.CER	ECJ0EB1E102K	B	93.3/22.1
C11	4030009990	S.CER	C1608 CH 1H 200J-T	B	91.7/21.9
C12	4030007090	S.CER	C1608 CH 1H 470J-T	B	89.8/21.7
C13	4030010000	S.CER	C1608 CH 1H 510J-T	B	87.9/20.9
C14	4030011530	S.CER	C1608 CH 1H 110J-T	B	90.7/33.4
C15	4030017460	S.CER	ECJ0EB1E102K	B	93.6/16
C16	4030017400	S.CER	ECJ0EC1H220J	B	89.6/34.6
C17	4030017630	S.CER	ECJ0EC1H120J	B	85.1/36.7
C18	4030017380	S.CER	ECJ0EC1H050B	B	85.1/38.7
C19	4030017460	S.CER	ECJ0EB1E102K	B	85.1/37.7
C20	4030017430	S.CER	ECJ0EC1H101J	B	85.1/33.4

[MAIN UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
C22	4030017550	S.CER ECJ0EC1H1R5B	B	81.7/37.7
C23	4030018860	S.CER ECJ0EB0J105K	T	74.7/37.2
C24	4030017460	S.CER ECJ0EB1E102K	T	82.3/35.7
C25	4030017580	S.CER ECJ0EC1H060C	B	83.4/37.7
C26	4030017430	S.CER ECJ0EC1H101J	B	78.2/33.4
C27	4030017460	S.CER ECJ0EB1E102K	T	78.8/35.7
C28	4030017370	S.CER ECJ0EC1H3R5B	B	80/36.7
C29	4030017370	S.CER ECJ0EC1H3R5B	B	80/37.7
C30	4030016930	S.CER ECJ0EB1A104K	T	77.1/39.7
C31	4030016930	S.CER ECJ0EB1A104K	T	78.8/38.7
C32	4030017460	S.CER ECJ0EB1E102K	B	76.8/39.9
C33	4030017420	S.CER ECJ0EC1H470J	B	75.8/39.9
C36	4030017460	S.CER ECJ0EB1E102K	B	74.8/35.6
C37	4030016790	S.CER ECJ0EB1C103K	B	75.8/37.7
C38	4030017570	S.CER ECJ0EC1H040B	B	74.8/37.7
C39	4030017460	S.CER ECJ0EB1E102K	B	73.7/35.6
C40	4030017550	S.CER ECJ0EC1H1R5B	B	72.9/39.4
C41	4030017580	S.CER ECJ0EB1H060C	B	68.5/39.2
C42	4030017460	S.CER ECJ0EB1E102K	T	68.9/38.5
C43	4030017460	S.CER ECJ0EB1E102K	T	68.9/39.5
C44	4030017380	S.CER ECJ0EC1H050B	B	69/37.8
C45	4030017460	S.CER ECJ0EB1E102K	B	72.2/35.6
C46	4030017420	S.CER ECJ0EC1H470J	B	62.2/39
C47	4030017460	S.CER ECJ0EB1E102K	B	62.2/39.9
C48	4030016790	S.CER ECJ0EB1C103K	B	64.2/37.1
C49	4030017630	S.CER ECJ0EC1H120J	B	66/39.9
C50	4030017460	S.CER ECJ0EB1E102K	B	64.2/36.1
C51	4030017460	S.CER ECJ0EB1E102K	B	66.1/32.1
C52	4030017590	S.CER ECJ0EC1H070C	B	66.1/35.7
C53	4030016790	S.CER ECJ0EB1C103K	B	64.2/33.1
C54	4030017460	S.CER ECJ0EB1E102K	B	64.2/34.1
C55	4030017570	S.CER ECJ0EC1H040B	B	64.2/31.1
C56	4030017400	S.CER ECJ0EC1H220J	B	64.3/23.8
C57	4030017460	S.CER ECJ0EB1E102K	T	64.1/36.6
C58	4030017460	S.CER ECJ0EB1E102K	B	53.9/24.3
C59	4030017460	S.CER ECJ0EB1E102K	B	49.5/25.2
C60	4030016790	S.CER ECJ0EB1C103K	B	52.5/26.9
C61	4030017430	S.CER ECJ0EC1H101J	B	49.5/22.7
C62	4030017510	S.CER ECJ0EC1H680J	B	47.5/17.6
				[RUS-02], [RUS-05] only
C63	4030017420	S.CER ECJ0EC1H470J	B	46.5/20.4
C64	4030016790	S.CER ECJ0EB1C103K	T	49.6/16.3
C65	4030017460	S.CER ECJ0EB1E102K	B	46.5/18.6
C66	4030017460	S.CER ECJ0EB1E102K	B	47.5/13.7
C67	4030017460	S.CER ECJ0EB1E102K	B	53.4/22.6
C68	4030017430	S.CER ECJ0EC1H101J	B	51.8/13.7
C69	4030017430	S.CER ECJ0EC1H101J	B	53.8/15.4
C70	4030017430	S.CER ECJ0EC1H101J	B	54.8/13.7
C71	4030016930	S.CER ECJ0EB1A104K	B	52.8/15.4
C72	4030017460	S.CER ECJ0EB1E102K	T	69.8/18.7
C73	4030017460	S.CER ECJ0EB1E102K	B	73.2/21.5
C74	4030017460	S.CER ECJ0EB1E102K	T	66.7/19.4
C75	4550006250	S.TAN TEESVA 1A 106M8R	B	53.3/11.7
C76	4030016930	S.CER ECJ0EB1A104K	T	66.7/21.1
C77	4030017460	S.CER ECJ0EB1E102K	T	65.7/22.8
C78	4030017460	S.CER ECJ0EB1E102K	T	74.3/21.1
C79	4030016930	S.CER ECJ0EB1A104K	T	72.3/21.1
C80	4030016930	S.CER ECJ0EB1A104K	T	68/18.7
C81	4030017490	S.CER C1608 JB 1A 105K-T	B	78.6/19.2
C82	4030017460	S.CER ECJ0EB1E102K	B	78.8/21.5
C83	4030017460	S.CER ECJ0EB1E102K	T	80.2/21.2
C84	4030017730	S.CER ECJ0EB1E471K	T	81.5/20.8
C85	4030017460	S.CER ECJ0EB1E102K	T	77.4/23.2
C86	4030017430	S.CER ECJ0EC1H101J	T	79.1/24.2
C87	4030017650	S.CER ECJ0EC1H270J	T	77.4/24.2
C88	4030017460	S.CER ECJ0EB1E102K	T	75.3/23.9
C89	4030016790	S.CER ECJ0EB1C103K	T	73.3/23.9
C90	4030017460	S.CER ECJ0EB1E102K	T	69.7/32.3
C91	4510008660	S.ELE EEE0JA220SR	B	69.7/20.3
C92	4030017430	S.CER ECJ0EC1H101J	T	74.2/31.3
C93	4030017650	S.CER ECJ0EC1H270J	T	68.1/36.2
C94	4030017420	S.CER ECJ0EC1H470J	T	69.3/23.9
C95	4030017460	S.CER ECJ0EB1E102K	T	67.7/33.9
C96	4030017460	S.CER ECJ0EB1E102K	T	70.7/32.3
C97	4030017420	S.CER ECJ0EC1H470J	T	71.8/32.3
C99	4030017460	S.CER ECJ0EB1E102K	T	65.6/32.1
C100	4030017620	S.CER ECJ0EC1H100C	B	60.4/36.1
C101	4030017460	S.CER ECJ0EB1E102K	T	91.7/34.1
C102	4030017590	S.CER ECJ0EC1H070C	T	59.9/33.4
C103	4030017360	S.CER ECJ0EC1H030B	B	58.6/35.3
C104	4030017460	S.CER ECJ0EB1E102K	T	58.2/29.8
C105	4030017460	S.CER ECJ0EB1E102K	B	55/37
C106	4030017420	S.CER ECJ0EC1H470J	B	70.6/34.8
C107	4030017460	S.CER ECJ0EB1E102K	T	60.2/38.6
C108	4030016790	S.CER ECJ0EB1C103K	T	73.1/35.2
C109	4030017460	S.CER ECJ0EB1E102K	B	57.7/40.3
C110	4030017730	S.CER ECJ0EB1E471K	B	56.5/28.8
C111	4030017460	S.CER ECJ0EB1E102K	B	56.6/34.4
C113	4030017540	S.CER ECJ0EC1HR75B	T	56.5/33.8
C114	4030017660	S.CER ECJ0EC1H330J	T	51.7/34.3
C115	4030017660	S.CER ECJ0EC1H330J	T	56.5/34.8
C116	4030017460	S.CER ECJ0EB1E102K	T	56.5/35.8
C118	4030017530	S.CER ECJ0EC1H0R5B	T	56.5/32.8
C119	4030017460	S.CER ECJ0EB1E102K	T	56.5/29.8
C120	4030017430	S.CER ECJ0EC1H101J	T	56.5/30.8
C121	4030017390	S.CER ECJ0EC1H180J	T	51.7/31.8
C122	4030017660	S.CER ECJ0EC1H330J	T	56.5/31.8
C123	4030017510	S.CER ECJ0EC1H680J	T	51.7/30.8
C124	4030017440	S.CER ECJ0EC1H221J	T	52.2/29.3
C126	4030017660	S.CER ECJ0EC1H330J	T	51.7/36.3
C127	4030017420	S.CER ECJ0EC1H470J	T	50/38.9
C129	4030017340	S.CER ECJ0EC1H010B	T	48/29.4
C132	4030016930	S.CER ECJ0EB1A104K	B	47.5/23.5
C133	4030017400	S.CER ECJ0EC1H220J	T	50.4/31.1

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REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
C134	4030017390	S.CER ECJ0EC1H180J	T	50.4/36.1
C135	4030017460	S.CER ECJ0EB1E102K	B	51.4/43.3
C137	4030016790	S.CER ECJ0EB1C103K	T	57.3/44.4
C138	4030017420	S.CER ECJ0EC1H470J	B	52.8/32.7
C139	4030016930	S.CER ECJ0EB1A104K	B	57.5/28.8
C140	4030016930	S.CER ECJ0EB1A104K	T	43.3/35.9
C141	4030017460	S.CER ECJ0EB1E102K	B	53.6/39.3
C143	4030017460	S.CER ECJ0EB1E102K	B	51.4/41.3
C144	4030017460	S.CER ECJ0EB1E102K	T	42.9/21
C145	4030017460	S.CER ECJ0EB1E102K	T	44.9/22.7
C146	4550000270	S.TAN TEESVA 1E 474M8R	B	50.5/32.3
C147	4550004040	S.TAN TEESVA 0J 685M8R	B	49.2/39.8
C148	4550006250	S.TAN TEESVA 1A 106M8R	T	50.3/43.7
C149	4550000270	S.TAN TEESVA 1E 474M8R	B	47.1/39.8
C150	4030018860	S.CER ECJ0EB0J105K	T	43.9/22.7
C151	4030016930	S.CER ECJ0EB1A104K	T	43.3/39.4
C152	4030017420	S.CER ECJ0EC1H470J	T	35.3/41.1
C153	4030017420	S.CER ECJ0EC1H470J	T	37/41.1
C154	4030017420	S.CER ECJ0EC1H470J	T	37.8/39.1
C155	4030017460	S.CER ECJ0EB1E102K	T	44.3/37.7
C156	4030017460	S.CER ECJ0EB1E102K	T	39.5/32
C157	4030017620	S.CER ECJ0EC1H100C	T	38.1/32.4
C158	4030016930	S.CER ECJ0EB1A104K	T	36.1/31.4
C159	4030017460	S.CER ECJ0EB1E102K	T	36.1/32.4
C160	4030016930	S.CER ECJ0EB1A104K	B	6.6/28.9
C161	4030017620	S.CER ECJ0EC1H100C	T	43.4/33.8
C162	4030017500	S.CER ECJ0EC1H560J	T	43.9/28.7
C163	4030017570	S.CER ECJ0EC1H040B	T	42.5/27.6
C164	4030017590	S.CER ECJ0EC1H070C	T	43.9/27.1
C165	4030016790	S.CER ECJ0EB1C103K	T	43.4/31.7
C166	4030017360	S.CER ECJ0EC1H030B	T	43.2/24.7
C167	4030016930	S.CER ECJ0EB1A104K	B	55.8/19.3
C168	4030016930	S.CER ECJ0EB1A104K	B	56.5/19.8
C169	4030016930	S.CER ECJ0EB1A104K	B	56.5/18.6
C171	4030017460	S.CER ECJ0EB1E102K	T	91.7/35.7
C172	4030017460	S.CER ECJ0EB1E102K	B	85.7/18.9
C174	4030017530	S.CER ECJ0EC1H0R5B	B	92.5/19.1
C175	4030017550	S.CER ECJ0EC1H1R5B	B	94.5/33.9
C176	4030017640	S.CER ECJ0EC1H150J	B	94.8/30
C182	4030017460	S.CER ECJ0EB1E102K	T	65.2/39.3
C183	4030017620	S.CER ECJ0EC1H100C	T	66.5/39.3
C184	4030017460	S.CER ECJ0EB1E102K	T	80.6/37.7
C185	4030016930	S.CER ECJ0EB1A104K	T	40.9/30.1
C186	4030016930	S.CER ECJ0EB1A104K	T	77.1/37.7
C188	4030017460	S.CER ECJ0EB1E102K	B	47.5/20.4
C190	4030017380	S.CER ECJ0EC1H050B	T	51/38.9
C191	4030017570	S.CER ECJ0EC1H040B	T	52/38.9
C192	4030017360	S.CER ECJ0EC1H030B	T	53.6/27.1
C193	4030017360	S.CER ECJ0EC1H030B	T	55.3/27.1
C194	4030017380	S.CER ECJ0EC1H050B	T	51.2/27.5
C195	4030017570	S.CER ECJ0EC1H040B	T	52.2/27.5
C200	4030017420	S.CER ECJ0EC1H470J	T	27.2/27.3
C201	4030018860	S.CER ECJ0EB0J105K	T	28.2/27.3
C202	4030016930	S.CER ECJ0EB1A104K	B	47/30.7
C203	4030017460	S.CER ECJ0EB1E102K	B	47/29.7
C205	4030017620	S.CER ECJ0EC1H100C	B	55.9/39.3
C206	4030017630	S.CER ECJ0EC1H120J	B	55.9/40.3
C207	4030017620	S.CER ECJ0EC1H100C	B	55.9/41.3
C208	4030017630	S.CER ECJ0EC1H120J	B	54.2/42.3
C209	4030017460	S.CER ECJ0EB1E102K	B	54.2/43.3
C211	4030018860	S.CER ECJ0EB0J105K	T	32.3/26.8
C213	4030016930	S.CER ECJ0EB1A104K	T	30.6/27.8
C221	4030016930	S.CER ECJ0EB1A104K	T	26.8/31.6
C222	4030016930	S.CER ECJ0EB1A104K	B	18.9/33.9
C223	4030016930	S.CER ECJ0EB1A104K	B	29.7/9
C224	4030016930	S.CER ECJ0EB1A104K	T	40.9/29.1
C225	4030017460	S.CER ECJ0EB1E102K	B	83/11.6
C226	4550005980	S.TAN TEESVA 1A 475M8R	B	81.2/13.5
C227	4030016790	S.CER ECJ0EB1C103K	B	86.9/13
C228	4510008540	S.ELE EEE1CA100SR	B	89.4/15.7
C229	4030017460	S.CER ECJ0EB1E102K	B	85.7/17.9
C230	4030016930	S.CER ECJ0EB1A104K	B	85.7/16.9
C231	4030016790	S.CER ECJ0EB1C103K	T	74.4/13.3
C232	4030017730	S.CER ECJ0EB1E471K	T	76.2/13.3
C233	4030016790	S.CER ECJ0EB1C103K	T	24.5/23
C234	4030017460	S.CER ECJ0EB1E102K	T	24.2/27.7
C235	4030016790	S.CER ECJ0EB1C103K	T	69.8/15.7
C236	4030017460	S.CER ECJ0EB1E102K	T	69.8/17.7
C237	4510008660	S.ELE EEE0JA220SR	B	76/15.5
C238	4030017460	S.CER ECJ0EB1E102K	T	78.5/16.9
C241	4030016930	S.CER ECJ0EB1A104K	T	35.3/9.8
C242	4030016930	S.CER ECJ0EB1A104K	T	44.7/9.8
C243	4030016790	S.CER ECJ0EB1C103K	T	40.5/9.8
C244	4030017460	S.CER ECJ0EB1E102K	B	46.5/15.4
C251	4030016970	S.CER ECJ0EB1C223K	T	33.4/17.1
C252	4030017740	S.CER ECJ0EB1E821K	T	29.9/16.1
C253	4030017740	S.CER ECJ0EB1E821K	T	33.4/14.9
C254	4030016930	S.CER ECJ0EB1A104K	T	33.

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REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
C276	4030016950	S.CER ECJ0EB1A473K	T	12.6/34.4
C277	4030016930	S.CER ECJ0EB1A104K	T	12.6/37.8
C278	4030017430	S.CER ECJ0EC1H101J	T	16.4/39.9
C279	4030018910	S.CER C1608 JB 0J 475K-T	T	36.8/21.6
C280	4030018110	S.CER ECJ0EB1H272K	T	21.1/27.8
C281	4030017780	S.CER ECJ0EB1E472K	T	17.7/26.8
C282	4030017710	S.CER ECJ0EC1H181J	T	17.7/29.8
C283	4030018900	S.CER ECJ0EB0J474K	T	19.4/31.7
C284	4030016930	S.CER ECJ0EB1A104K	T	22.9/39.1
C285	4030016930	S.CER ECJ0EB1A104K	T	22.9/40.1
C286	4030017460	S.CER ECJ0EB1E102K	B	16.6/41.2
C287	4550006250	S.TAN TEESVA 1A 106M8R	B	22.1/40.7
C288	4030017460	S.CER ECJ0EB1E102K	B	18.6/39.5
C289	4030016930	S.CER ECJ0EB1A104K	B	19.5/30.2
C290	4030017920	S.CER ECJ0EB1A683K	T	27.5/16.1
C291	4030016780	S.CER ECJ0EB1C153K	T	25.7/10.9
C292	4030016930	S.CER ECJ0EB1A104K	T	25.7/13.9
C293	4030017740	S.CER ECJ0EB1E821K	T	25.7/11.9
C294	4030016930	S.CER ECJ0EB1A104K	T	23.9/13.9
C295	4030018110	S.CER ECJ0EB1H272K	T	29/5.1
C296	4030018240	S.CER ECJ0EB1E562K	T	29/6.1
C297	4030017710	S.CER ECJ0EC1H181J	T	27.1/7.1
C298	4030018090	S.CER ECJ0EB1C822K	T	30.8/7.1
C299	4030017510	S.CER ECJ0EC1H680J	T	30.8/5.1
C300	4030017450	S.CER ECJ0EB1E271K	T	18.4/39.9
C304	4030017460	S.CER ECJ0EB1E102K	B	57.7/11.4
C305	4030017460	S.CER ECJ0EB1E102K	T	11.3/24.3
C306	4030017460	S.CER ECJ0EB1E102K	B	61.7/12
C307	4030017460	S.CER ECJ0EB1E102K	B	61.7/10.2
C308	4030017460	S.CER ECJ0EB1E102K	T	75.7/9.8
C309	4030017460	S.CER ECJ0EB1E102K	B	75.5/11.3
C310	4030016930	S.CER ECJ0EB1A104K	T	21.3/11.9
C311	4030017460	S.CER ECJ0EB1E102K	B	65.4/8.7
C312	4030017420	S.CER ECJ0EC1H470J	B	74.5/6.1
C313	4030017420	S.CER ECJ0EC1H470J	B	33.9/7.8
C314	4030017460	S.CER ECJ0EB1E102K	T	86.6/3.3
C315	4030017460	S.CER ECJ0EB1E102K	T	93.2/5.9
C316	4030016930	S.CER ECJ0EB1A104K	T	91.6/2.8
C317	4550007080	S.TAN TEESVA 1C 106M8R	B	93/11.3
C318	4030016930	S.CER ECJ0EB1A104K	T	90.4/10.1
C319	4030016930	S.CER ECJ0EB1A104K	T	89.6/3.7
C320	4030017730	S.CER ECJ0EB1E471K	T	88.6/3.7
C321	4030017460	S.CER ECJ0EB1E102K	B	19.3/4.2
C322	4030016950	S.CER ECJ0EB1A473K	T	94/14
C323	4030016950	S.CER ECJ0EB1A473K	T	88.1/10.1
C324	4030017420	S.CER ECJ0EC1H470J	T	85.2/14.1
C325	4550006250	S.TAN TEESVA 1A 106M8R	T	89.4/17.6
C326	4510008900	S.ELE EEEFC0J101P	B	87.8/8.9
C335	4030018860	S.CER ECJ0EB0J105K	B	54.6/22.6
C339	4030016930	S.CER ECJ0EB1A104K	B	5.9/17.2
C340	4030016930	S.CER ECJ0EB1A104K	B	9.3/12.5
C341	4030016930	S.CER ECJ0EB1A104K	B	5.9/10.1
C342	4030017630	S.CER ECJ0EC1H120J	B	18.3/4.2
C343	4030017580	S.CER ECJ0EC1H060C	B	5.6/4.2
C344	4030017640	S.CER ECJ0EC1H150J	B	7.6/9.1
C345	4030016930	S.CER ECJ0EB1A104K	B	11/11.2
C346	4030016930	S.CER ECJ0EB1A104K	B	11/10.1
C347	4030016790	S.CER ECJ0EB1C103K	T	8.9/6.3
C348	4030016930	S.CER ECJ0EB1A104K	T	6/10
C349	4030016930	S.CER ECJ0EB1A104K	T	21.3/14.9
C350	4030017460	S.CER ECJ0EB1E102K	T	59.4/43.4
J1	6510021901	S.CNR BM02B-ASRS-TF (LF) (SN)	T	86.6/6.8
J2	6450001680	CNR HSJ1122-010010		
J3	6450002250	CNR HSJ1456-010320		
J4	6510018430	S.CNR AXN330C038P	B	11.8/30.6
J5	6510021901	S.CNR BM02B-ASRS-TF (LF) (SN)		
		[RUS-02], [RUS-05] only	T	50.4/11.7
F1	5210000830	S.FUS ERBFE3R00U	T	98/14.8
DS1	5040002670	S.LED CL-165HR/YG	T	102.8/12.4
MC1	7700002750	MIC EM9745P-38-G <HOR>		
S1	2260002840	SW SKHLLFA010		
S2	2260002800	S.SW SW-167 (SKOTLAE010)	B	99.4/44.2
S3	2260002800	S.SW SW-167 (SKOTLAE010)	B	60.9/44.2
S4	2250000490	ECR TP70TF5163-15.9F-2775		
		[16CH] only		
EP2	6910015600	S.BEA ACZ1005Y-241 (240)	T	77.4/22.2
EP3	6910015370	S.BEA ACZ1005Y-102-T	T	34.7/32
EP4	6910015370	S.BEA ACZ1005Y-102-T	B	55.5/30.5
EP6	6910015370	S.BEA ACZ1005Y-102-T	T	44.3/35.9

[CONNECT UNIT]

REF NO.	PARTS NO.	DESCRIPTION	M.	H/V LOCATION
C501	4030017460	S.CER ECJ0EB1E102K	T	8.3/5.3
C502	4030016930	S.CER ECJ0EB1A104K	T	9.3/5.3
J501	6910016390	CNR IMSA-9230B-1-02Z145-PT1		

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)
S.=Surface mount

• BC-160 (Optional)

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
IC1	1110006480	S.IC NJM2801U1-0543-TE1	B	10.2/62.3
IC2	1110003071	S.IC uPC494GS-E1-A	B	13/36.7
IC3	1140012301	S.IC uPD789112AMC-534-5A4-A	B	19.1/19.6
IC4	1110002700	S.IC NJM2904M-TE1	B	35.1/13.8
Q1	1530002060	S.TR 2SC4081 T106 R	B	37.3/63.9
Q2	1550000090	S.FET RSQ035P03TR	B	37.3/60.9
Q3	1530002060	S.TR 2SC4081 T106 R	B	35.8/19.3
Q4	1530002060	S.TR 2SC4081 T106 R	B	41.6/18.3
Q5	1590000430	S.TR DTC144EUA T106	B	23.7/26.6
Q6	1530002060	S.TR 2SC4081 T106 R	B	22.5/58.2
D1	1730002350	S.ZEN MA8110-M (TX)	B	17.6/60.5
D2	1750000550	S.DIO 1SS355 TE-17	B	34.8/64.4
D3	1750001110	S.DIO SM240A-T	B	44.4/56
D4	1160000070	S.DIO DAN202K T146	B	26.9/20.6
D5	1750000550	S.DIO 1SS355 TE-17	B	27.2/15
X1	6060000790	S.CER CSTCR4M91G	B	10.3/17.7
L1	6190001640	S.COL SLF12555T-101M1R1	B	35.3/52.7
L2	6200002611	S.COL NLV25T-R47J	B	20.8/28.2
R2	7030000460	S.RES MCR10EZJH 4.7 k	B	20.3/58.6
R3	7030003410	S.RES ERJ3GEYJ 561 V (560)	B	37.3/65.8
R4	7030003200	S.RES ERJ3GEYJ 100 V (10)	B	34.6/61.1
R5	7030009580	S.RES ERJ8RSJ R12V	B	31.8/73
R6	7030000540	S.RES MCR10EZJH 22 k	B	30.1/26.8
R7	7030000380	S.RES MCR10EZJH 1 k	B	30.1/29.6
R8	7030003520	S.RES ERJ3GEYJ 472 V (4.7 k)	B	39.5/18.4
R9	7030003600	S.RES ERJ3GEYJ 223 V (22 k)	B	13.8/30.5
R10	7030000740	S.RES MCR10EZJH 1 M	B	25.8/34.9
R11	7030000540	S.RES MCR10EZJH 22 k	B	24.8/37.8
R12	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	10.8/30.5
R13	7030003600	S.RES ERJ3GEYJ 223 V (22 k)	B	19.3/34.5
R14	7030003770	S.RES ERJ3GEYJ 564 V (560 k)	B	21/34.5
R15	7030003650	S.RES ERJ3GEYJ 563 V (56 k)	B	21/40.3
R16	7030003770	S.RES ERJ3GEYJ 564 V (560 k)	B	19.3/40.3
R17	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	22.7/40.3
R18	7030003410	S.RES ERJ3GEYJ 561 V (560)	B	8.6/43.5
R19	7030003620	S.RES ERJ3GEYJ 333 V (33 k)	B	16.7/42.1
R20	7030000560	S.RES MCR10EZJH 33 k	B	28.1/40.4
R21	7030000380	S.RES MCR10EZJH 1 k	B	26.3/28.6
R22	7030000440	S.RES MCR10EZJH 3.3 k	B	24/11.4
R23	7030000460	S.RES MCR10EZJH 4.7 k	B	24/8.8
R24	7030000260	S.RES MCR10EZJH 100 (101)	B	20.3/11.4
R25	7030000260	S.RES MCR10EZJH 100 (101)	B	20.3/8.8
R26	7030000500	S.RES MCR10EZJH 10 k	B	30.5/22
R27	7030007220	S.RES ERA3YED 202V (2 k)	B	30.2/19.6
R28	7030011200	S.RES ERA3YEB 303V (30 k)	B	30/18.1
R29	7030011190	S.RES ERA3YEB 103V (10 k)	B	26.9/16.6
R30	7030005871	S.RES ERA3YKD 104V (100 k)	B	40.4/15.1
R31	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	29.8/15.9
R32	7030005341	S.RES ERA3YED 332V (3.3 k)	B	43.4/11.1
R33	7030000500	S.RES MCR10EZJH 10 k	B	31.7/9.8
R34	7030000740	S.RES MCR10EZJH 1 M	B	42.1/14.4
R35	7030003440	S.RES ERJ3GEYJ 102 V (1 k)	B	40.4/12.2
R36	7030000460	S.RES MCR10EZJH 4.7 k	B	34.7/23.8
R37	7030005501	S.RES ERA3YKD 124V (120 k)	B	33.6/21.3
R38	7030005671	S.RES ERA3YKD 393V (39 k)	B	30.1/25.1
R39	7030000010	S.RES MCR10EZJH JPW	B	28.1/42.2
R40	7030000010	S.RES MCR10EZJH JPW	B	27.7/8.4
R41	7030000010	S.RES MCR10EZJH JPW	B	34.6/9.2
R42	7030008240	S.RES ERJ12YJ0R00U	B	38.9/7.4
R43	7030000010	S.RES MCR10EZJH JPW	B	30.1/33.3
R44	7030000010	S.RES MCR10EZJH JPW	B	28.1/33.3
R45	7030000010	S.RES MCR10EZJH JPW	B	29.1/38
R46	7030000010	S.RES MCR10EZJH JPW	B	29.1/36.1
R47	7030000010	S.RES MCR10EZJH JPW	B	43.9/18.3
R48	7030008240	S.RES ERJ12YJ0R00U	B	43/28.9
R49	7030000010	S.RES MCR10EZJH JPW	B	23.5/5.7
R50	7030008240	S.RES ERJ12YJ0R00U	B	34.1/38.2
R51	7030000010	S.RES MCR10EZJH JPW	B	23.9/34.9
R52	7030000010	S.RES MCR10EZJH JPW	B	24.7/32
R53	7030008240	S.RES ERJ12YJ0R00U	B	38.6/33.1
R54	7030000010	S.RES MCR10EZJH JPW	B	34.4/33
R55	7030000010	S.RES MCR10EZJH JPW	B	32/60.1
R56	7030000010	S.RES MCR10EZJH JPW	B	42.1/41.5
R57	7030000010	S.RES MCR10EZJH JPW	B	37.2/41.5
R58	7030000010	S.RES MCR10EZJH JPW	B	24.9/57
R59	7030000010	S.RES MCR10EZJH JPW	B	27.6/49.3
R60	7030000010	S.RES MCR10EZJH JPW	B	16.3/58.3
R61	7030000010	S.RES MCR10EZJH JPW	B	4.9/31.7
R62	7030000010	S.RES MCR10EZJH JPW	B	39.1/41.5
R63	7030000010	S.RES MCR10EZJH JPW	B	31.4/43.6
R64	7030000010	S.RES MCR10EZJH JPW	B	40.1/38.7
R65	7030000010	S.RES MCR10EZJH JPW	B	4.9/49.5
R66	7030003560	S.RES ERJ3GEYJ 103 V (10 k)	B	8.2/13.6
R67	7030000100	S.RES MCR10EZJH 4R7 (4.7)	B	10.2/45.1
C1	4030006900	S.CER C1608 JB 1H 103K-T	B	44.5/70.7
C2	4030006900	S.CER C1608 JB 1H 103K-T	B	48.2/73.5
C3	4030006860	S.CER C1608 JB 1H 102K-T	B	44.5/67.8

[MAIN UNIT]

REF NO.	ORDER NO.	DESCRIPTION	M.	H/V LOCATION
C4	4030006900	S.CER C1608 JB 1H 103K-T	B	32.9/69.7
C5	4030006900	S.CER C1608 JB 1H 103K-T	B	32.9/71.1
C6	4510008540	S.ELE EEE1CA100SR	B	17.5/63.8
C7	4030011600	S.CER C1608 JB 1E 104K-T	B	13.4/60.8
C8	4030006900	S.CER C1608 JB 1H 103K-T	B	9.2/58.7
C9	4030011600	S.CER C1608 JB 1E 104K-T	B	13.4/63.8
C10	4510009150	S.ELE EEE1EA470WP	B	43.6/62.8
C11	4030006900	S.CER C1608 JB 1H 103K-T	B	35.8/67.9
C12	4030006900	S.CER C1608 JB 1H 103K-T	B	32.4/67.9
C13	4510009150	S.ELE EEE1EA470WP	B	26.5/62.8
C14	4510008660	S.ELE EEE0JA220SR	B	34.3/28
C15	4510008660	S.ELE EEE0JA220SR	B	40.8/23.8
C16	4030006860	S.CER C1608 JB 1H 102K-T	B	12.3/30.5
C17	4030011600	S.CER C1608 JB 1E 104K-T	B	19.3/37.4
C18	4030006900	S.CER C1608 JB 1H 103K-T	B	21/37.4
C19	4030006900	S.CER C1608 JB 1H 103K-T	B	13.1/42.2
C20	4030009980	S.CER C1608 JB 1H 152K-T	B	8.6/42.1
C21	4030011600	S.CER C1608 JB 1E 104K-T	B	9.5/21.9
C22	4030006900	S.CER C1608 JB 1H 103K-T	B	19/25.5
C23	4030006900	S.CER C1608 JB 1H 103K-T	B	26.9/23.2
C24	4030006900	S.CER C1608 JB 1H 103K-T	B	26.9/18
C25	4030004760	S.CER C2012 JF 1H 104Z-T	B	33.2/17.5
C26	4030006900	S.CER C1608 JB 1H 103K-T	B	41.9/11.1
C27	4030006900	S.CER C1608 JB 1H 103K-T	B	29.5/12.6
C28	4030006900	S.CER C1608 JB 1H 103K-T	B	30.1/23.7
J1	6510024940	CNR HEC2305-016250		
DS1	5040002740	LED RT3-03HRYG		

M.=Mounted side (T: Mounted on the Top side, B: Mounted on the Bottom side)
S.=Surface mount

SECTION 7

MECHANICAL PARTS

[CHASSIS PARTS]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
J1	6910015910	ANT CONNECTOR 104	1
J2	6910015860	IMSA-6277S-O2A-G	1
S1	2260002870	AS-243-A13 [2CH] only	1
SP1	2510001061	K036NA500-67	1
W1	8900009640	OPC-963	1
W2	8900009640	OPC-963 [2CH] only	1
MP1	8010019695	2775 CHASSIS-5	1
MP2	8210020920	2775 FRONT PANEL (Incl. MP3, 4, 5, 6, 7) [16CH]	1
	8210020930	2775 FRONT PANEL (A) (Incl. MP3, 4, 5, 6, 7) [2CH]	1
	8210024600	2775 A-FRONT PANEL (Incl. MP3, 4, 5, 6, 7, 43) [F3018]	1
MP3	8210020820	2775 PTT PANEL [Others]	1
	8210024560	2775 A-PTT PANEL [F3018]	1
MP4	8930063360	2775 PTT BUTTON	1
MP5	8930063370	2775 PTT RUBBER	1
MP6	8930040390	SPEAKER NET (B)	1
MP7	8930046050	SPEAKER NET (C)	1
MP8	8210020550	2721 REAR PANEL	1
MP9	8930063351	2775 LENS-1	1
MP10	8610011930	KNOB N-318 (Incl. MP23)	1
MP11	8610012130	KNOB N-323 (Incl. MP24) [16CH] only	1
MP13	8930075190	2775 C-MAIN SEAL [16CH]	1
	8930063340	2775 A-MAIN SEAL [2CH]	1
MP14	8930063060	2721 T-RUBBER	1
MP16	8930063400	2775 SIDE PLATE	1
MP17	8930063411	2775 B-TOP PLATE-1 [16CH]	1
	8930063420	2775 A-TOP PLATE [2CH]	1
MP20	8930043760	1923 MIC SEAL	1
MP21	8930059360	2600 RELEASE BUTTON	1
MP22	8930070362	2775 RELEASE PLATE (A)-2	1
MP23	8610007510	KNOB SPRING NO.7800	1
MP24	8610007920	KNOB SPRING NO.1500 [16CH] only	1
MP25	8830001720	2721 ANT NUT	1
MP26	8810009221	SCREW BT B0 2X8 NI-ZK3 (BT)	2
MP27	8810009561	SCREW BT B0 2X6 NI-ZK3 (BT)	2
MP28	8810009511	SCREW BT B0 2X4 NI-ZC3 (BT)	9
MP29	8810009511	SCREW BT B0 2X4 NI-ZC3 (BT)	1
MP30	8810009511	SCREW BT B0 2X4 NI-ZC3 (BT)	1
MP31	8810010430	SCREW TRUSS M3X5 SUS SSBC	1
MP32	8930051290	2251 OPT SHEET	1
MP33	8930042350	1922 MIC SHEET	1
MP34	8930056540	PUSH SPRING (AH)	2
MP35	8830001701	VR NUT (Q)-1	1
MP36	8830001701	VR NUT (Q)-1 [16CH] only	1
MP37	8830001741	VR NUT (S)-1 [2CH] only	1
MP42	8930074580	2775 NAME SHEET [F3018] only	1
MP43	8930074610	SP NET (E) [F3018] only	1

[ANT UNIT]

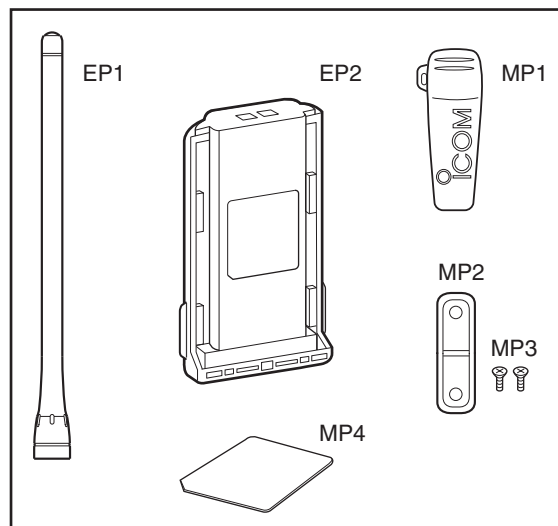
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MP601	8510016350	2721 ANT PLATE	1

[CONNECT UNIT]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
J501	6910016390	IMSA-9230B-1-02Z145-PT1	1

[ACCESSORIES]

REF NO.	ORDER NO.	DESCRIPTION	QTY.
EP1**	—	FA-SC55V-2	1
EP2**	—	BP-232N	1
EP3**	—	BC-160 [USA-03], [USA-04] only	1
EP4**	—	BC-145A [USA-03]	1
	—	BC-145E [USA-04]	1
MP1**	—	MB-94	1
MP2	8210020560	2721 JACK PANEL [Others]	1
	8210022780	2927 JACK PANEL [F3018]	1
MP3	8810004861	SCREW PH M2X6 ZK3	2
MP4	8930051290	2251 OPT SHEET	1



[MAIN UNIT]

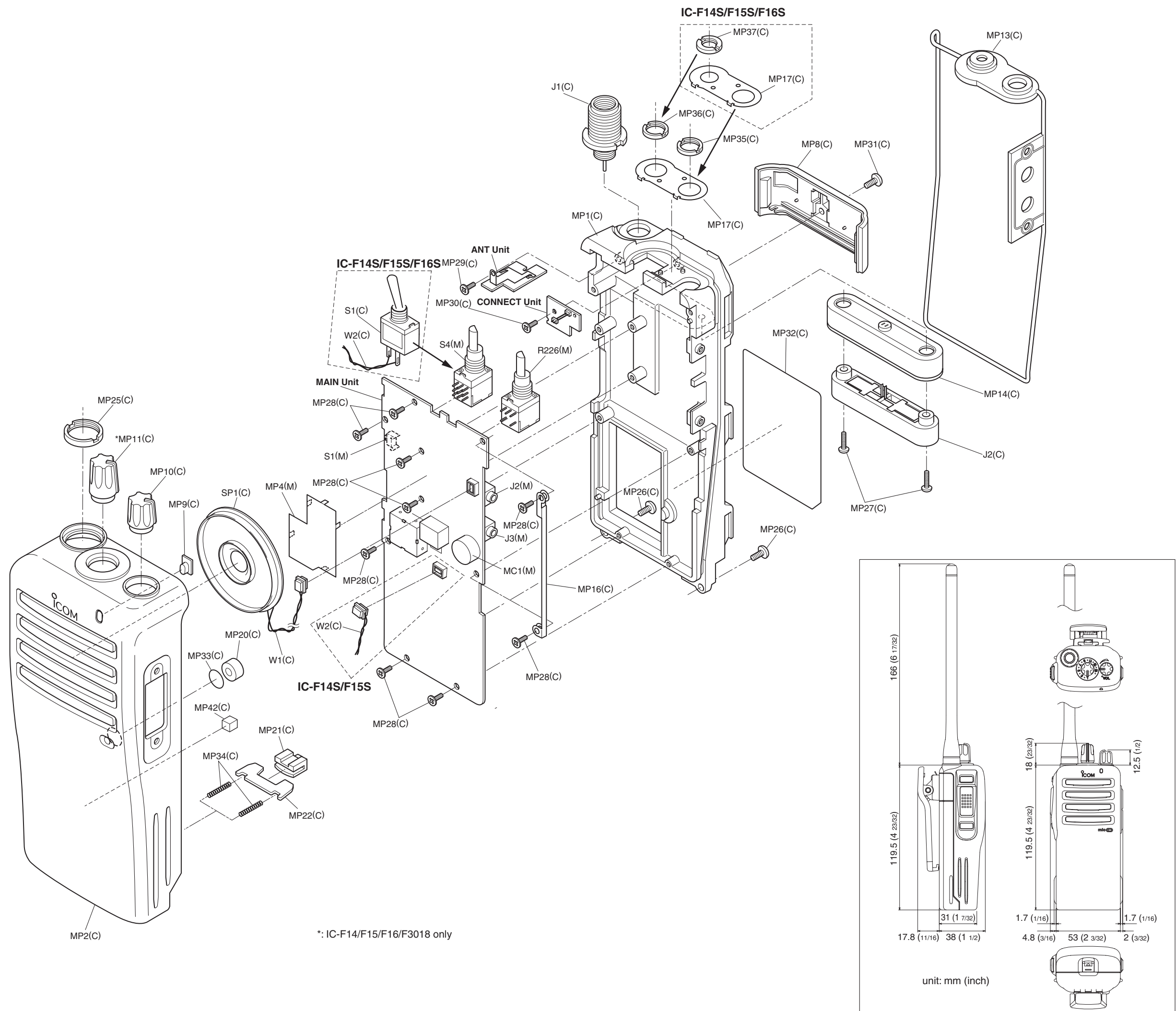
REF NO.	ORDER NO.	DESCRIPTION	QTY.
J2	6450001680	HSJ1122-010010	1
J3	6450002250	HSJ1456-010320	1
MC1*	7700002750	EM9745P-38-G	1
S1	2260002840	SKHLLFA010	1
S4	2250000490	TP70TF5163 15.9F-2775 [16CH] only	1
MP1*	8410002531	2681 PA HEATSINK-1	1
MP2	8510016460	2775 VCO COVER	1
MP3*	8510016470	2775 VCO CASE	1
MP4*	8510016580	2775 SHIELD PLATE	1

*: Refer to “BOARD LAYOUTS.”

** : Optional product.

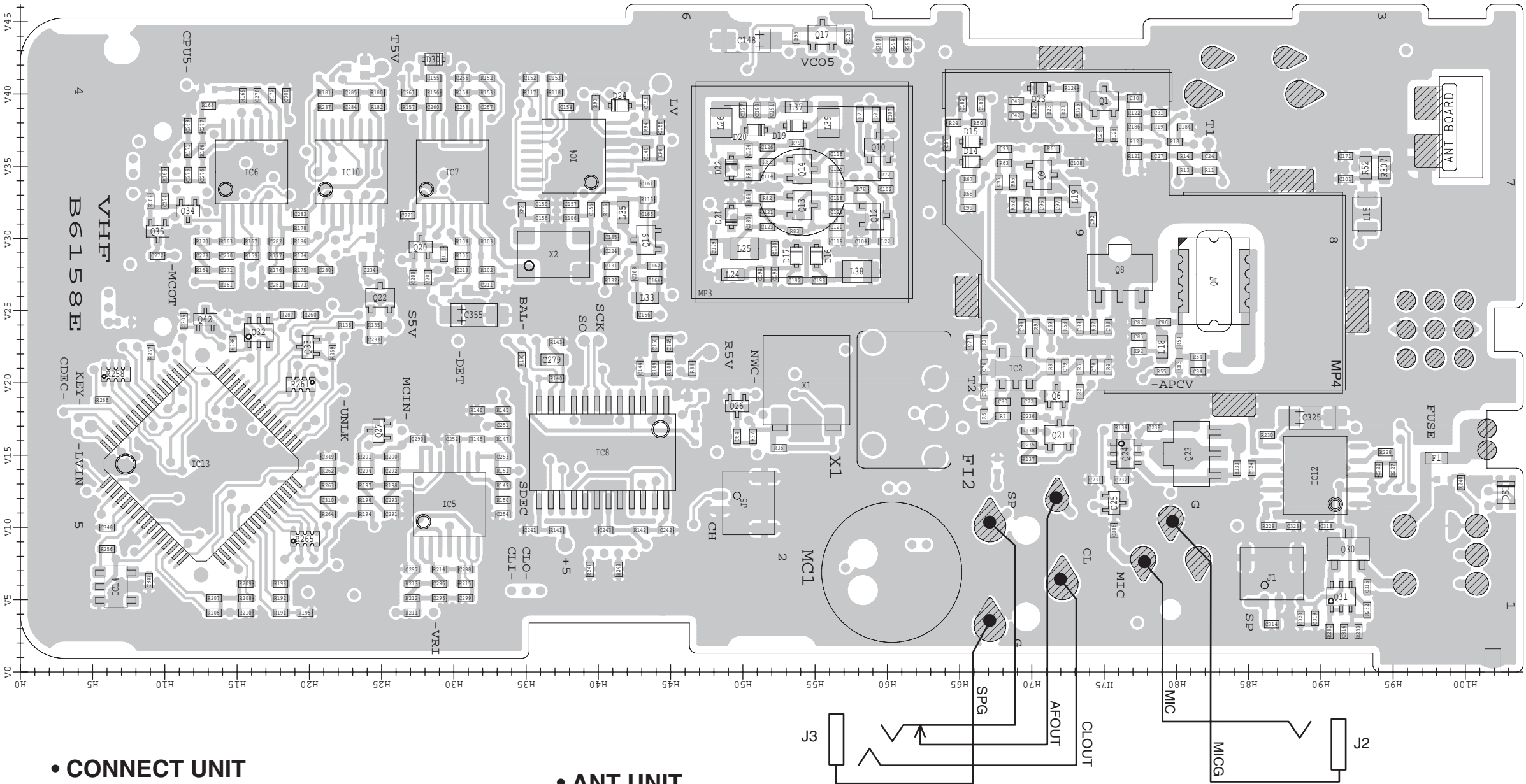
Screw abbreviations

A, B0, BT: Self-tapping PH: Pan head ZK: Black NI-ZU: Nickel-Zinc SUS: Stainless



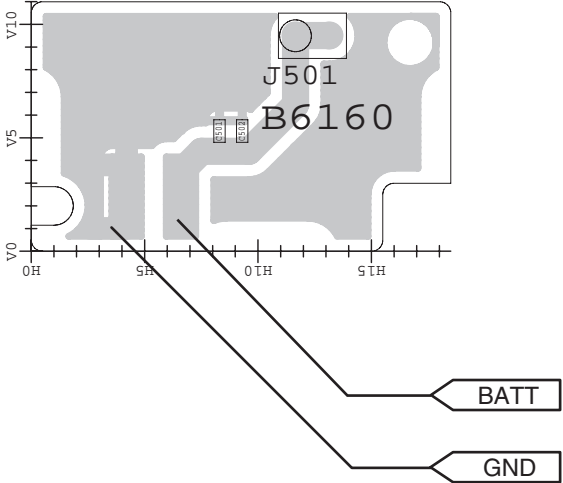
*: IC-F14/F15/F16/F3018 only

• MAIN UNIT
(TOP VIEW)

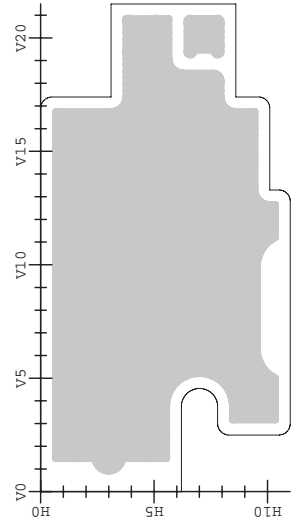


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

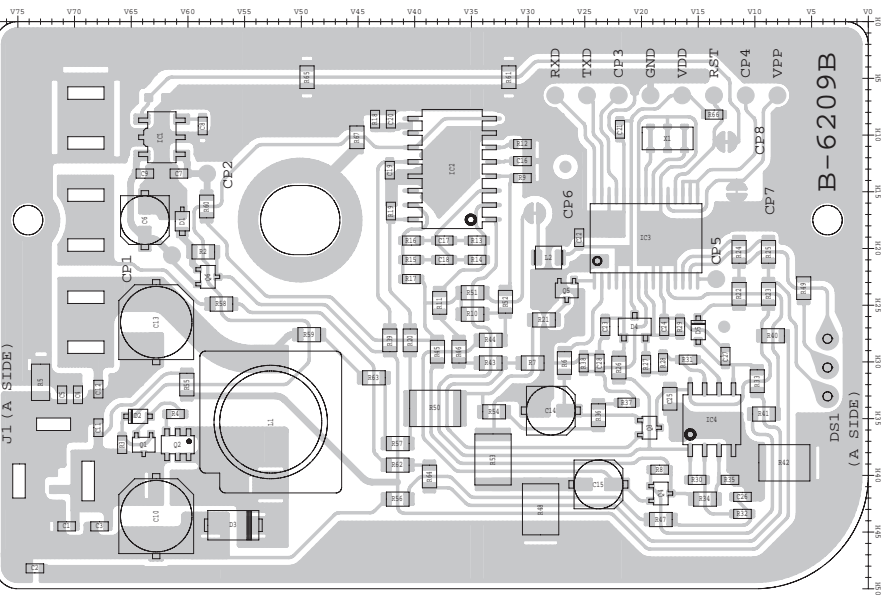
• CONNECT UNIT
(TOP VIEW)



• ANT UNIT
(TOP VIEW)

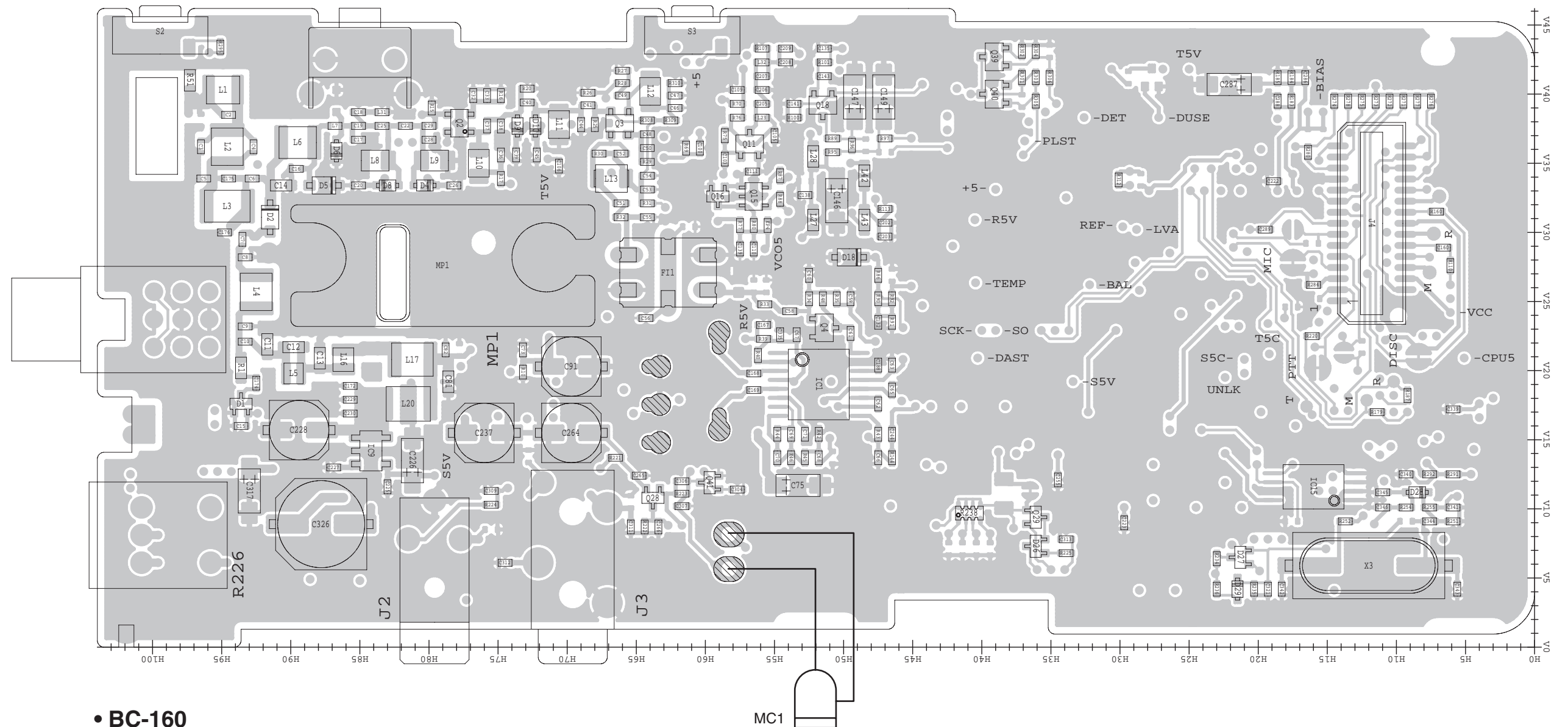


• BC-160
(TOP VIEW)

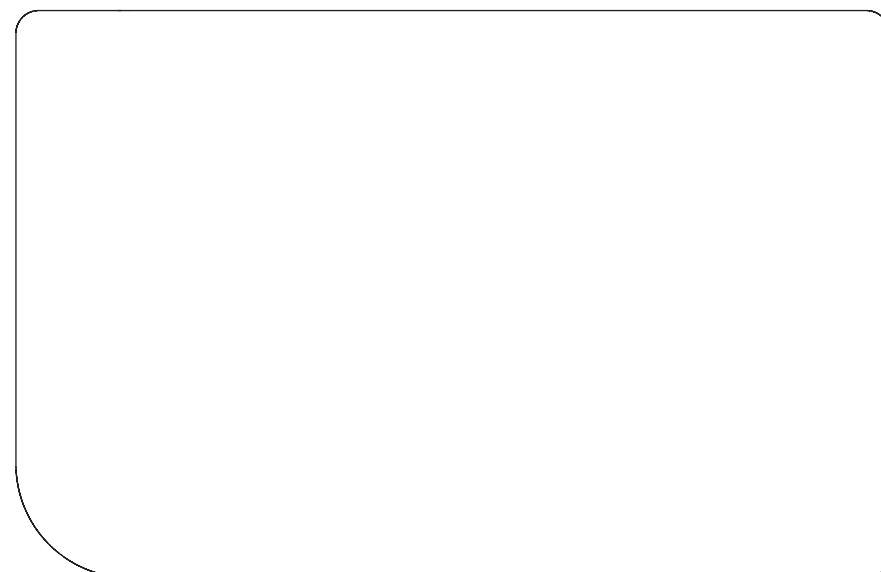


The combination of this side and the bottom side shows the board layout in the same configuration as the actual P.C.Board.

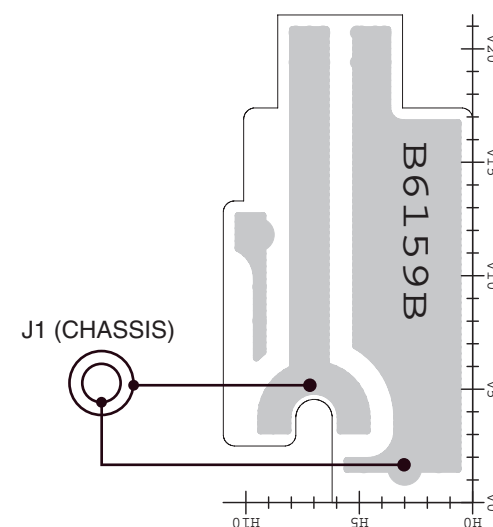
- **MAIN UNIT
(BOTTOM VIEW)**



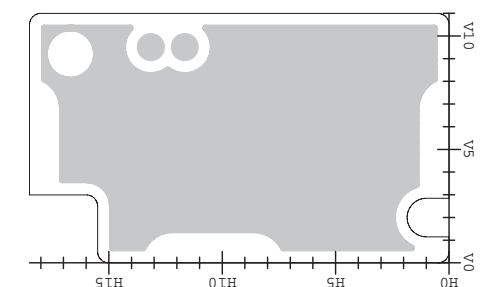
- **BC-160**
(BOTTOM VIEW)

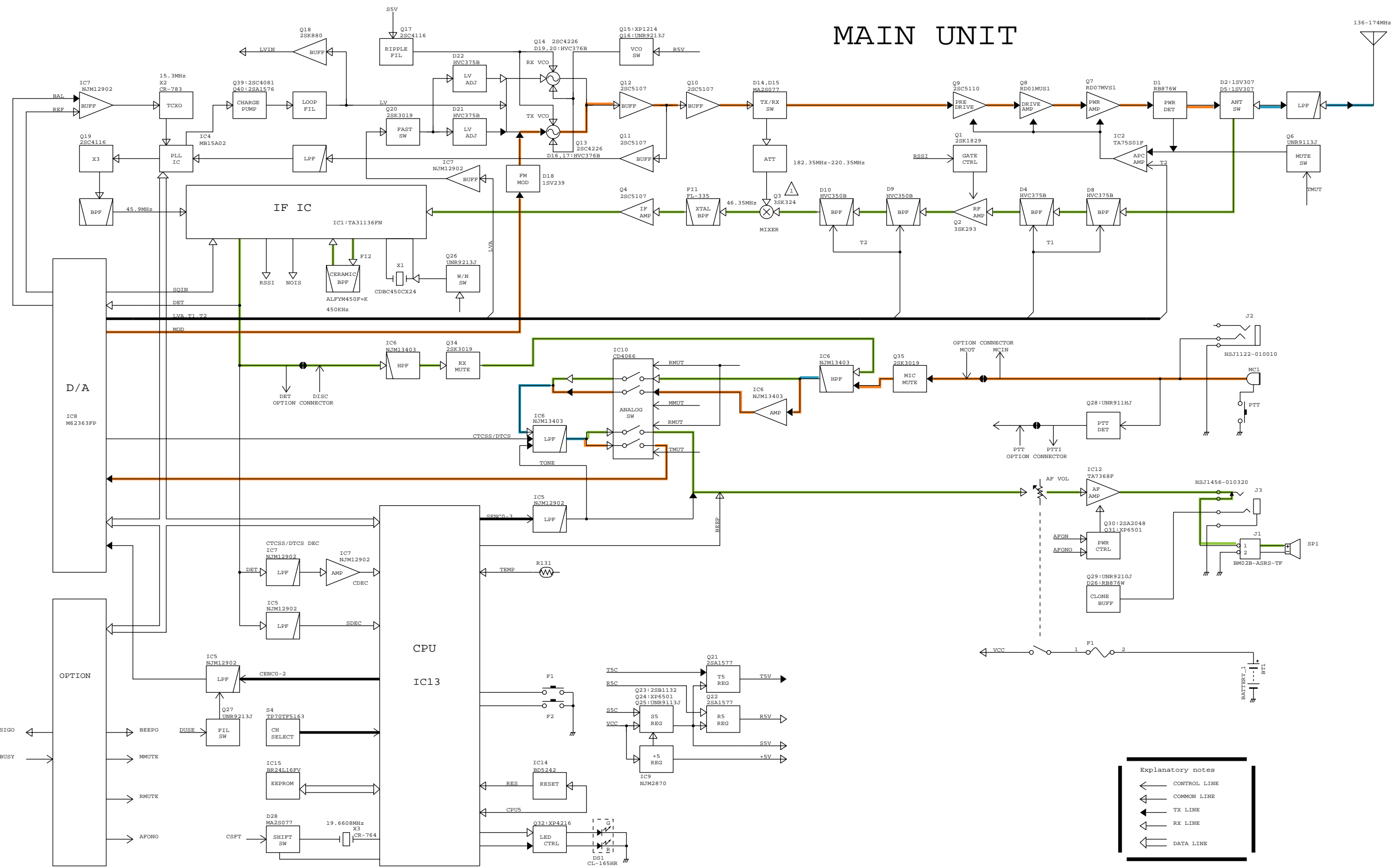


- **ANT UNIT
(BOTTOM VIEW)**



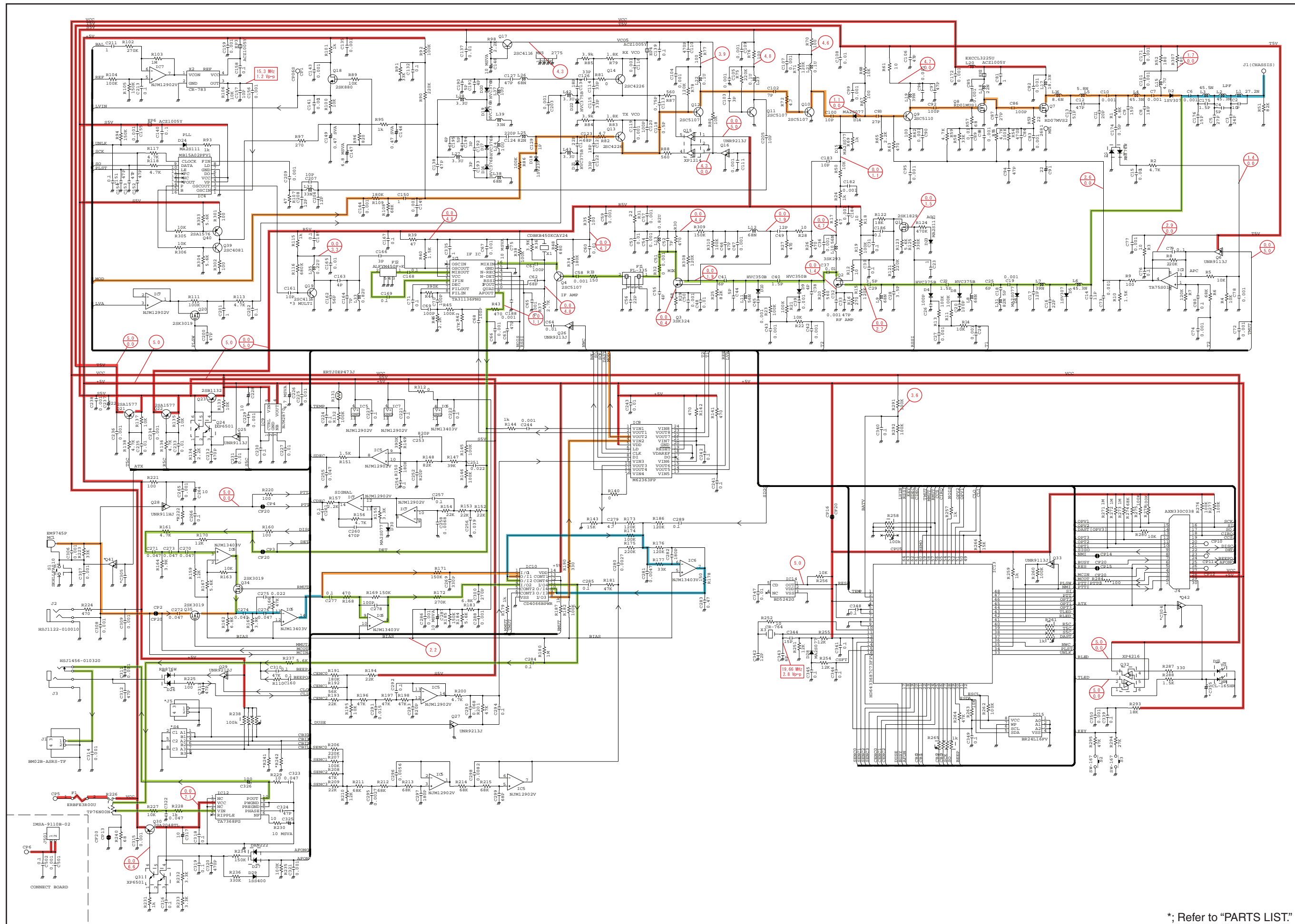
- **CONNECT UNIT
(BOTTOM VIEW)**





SECTION 10

VOLTAGE DIAGRAM



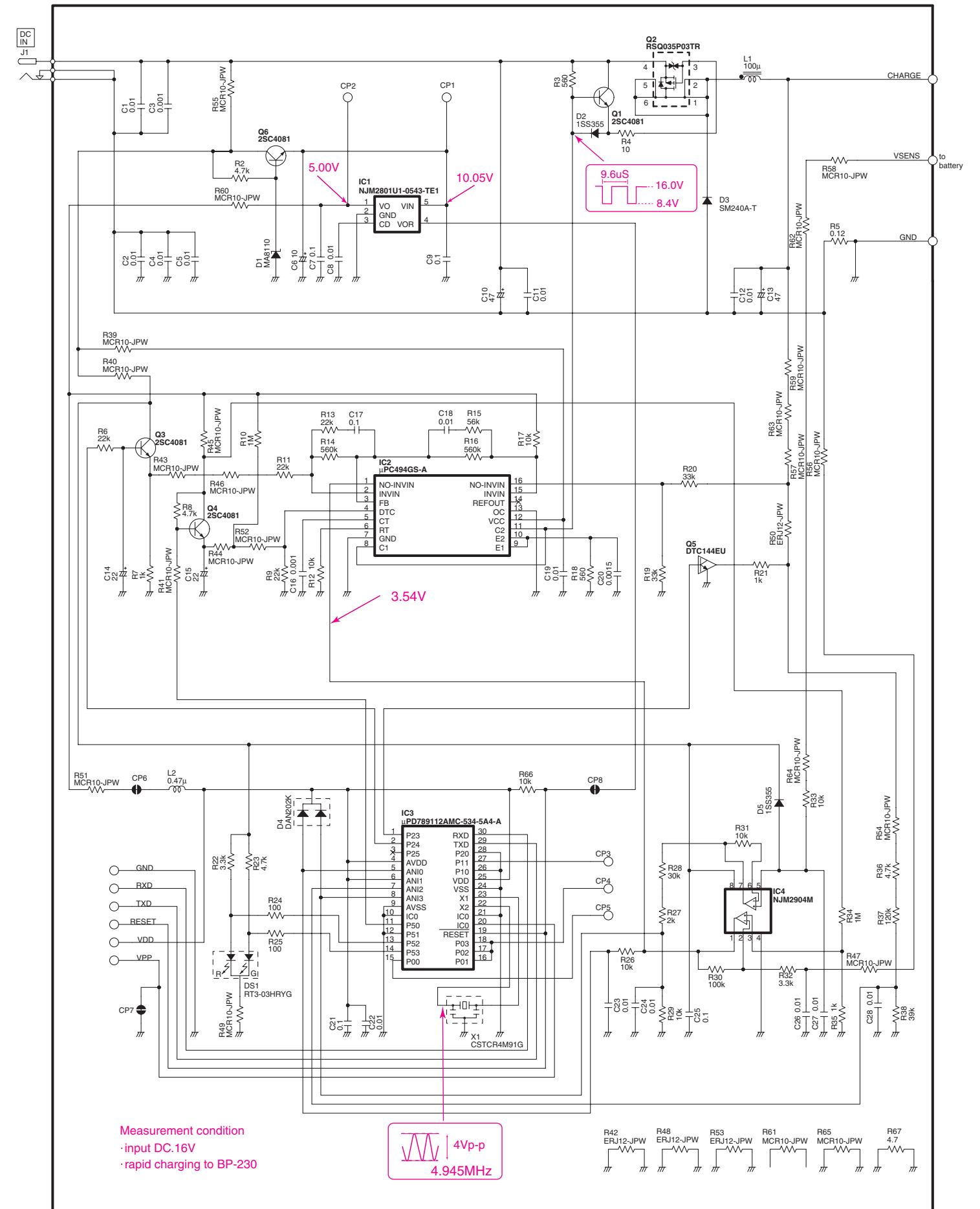
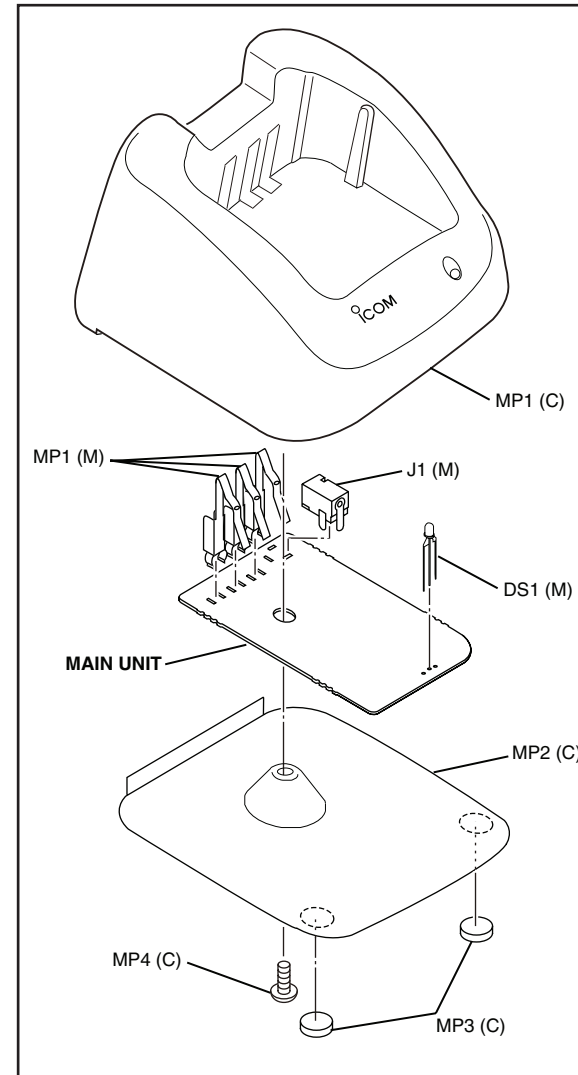
*; Refer to "PARTS LIST".

BC-160 (Optional)

REF. NO.	ORDER NO.	DESCRIPTION	QTY
MP1	8010019750	2830 case	1
MP2	8110008220	2830 cover	1
MP3	8930039620	Leg cushion (A)	2
MP4	8810008630	Screw PH BT M3 x 6 NI-ZU	1

REF. NO.	ORDER NO.	DESCRIPTION	QTY
J1	6510023070	Connector HEC2305-01-250	1
DS1	5040002740	LED RT3-03HRYG	1
MP1	8930064410	2830 TERMINAL	3

REF NO.	ORDER NO.	DESCRIPTION	QTY
EP1	Optional product	Charger BC-145E [EUR]	1
	Optional product	Charger BC-145UK [UK]	1



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